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TRANSACTIONS

OT THE

WISCONSIN

STATE HORTICULTURAL SOCIETY.

PROCEEDINGS, ESSAYS AND REPORTS

AT THE

ANNUAL WINTER MEETING.

Held at Madison, February 3, 4 and 5, 1874.

COMPILED BY G. E. MORROW, SECRETARY.

MADISON, WIS.:
ATWOOD & CULVER, PRINTERS AND STEREOTYPERS.
1874.

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LIST OF OFFICERS.

1874.

PRESIDENT.

J. S. STICKNEY, - - - - - WAUWATOSA.

VICE PRESIDENT.

A. G. TUTTLE, - - - - - - BARABOO.

RECORDING SECRETARY.

G. E. MORROW, - - - - - MADISON.

CORRESPONDING SECRETARY.

G. J. KELLOGG, - - - - - - JANESVILLE.

TREASURER.

G. A. MASON, - - - - - - MADISON.

STANDING COMMITTEES.

EXECUTIVE.

J. M. SMITH, - - - - - - GREEN BAY.
HON. M. ANDERSON, - - - - - CROSS PLAINS.
H. M. THOMPSON, - - - - - - ST. FRANCIS.

OBSERVATION.

J. M. SMITH, - - - - - - GREEN BAY.
G. J. KELLOGG, - - - - - - JANESVILLE.
I. J. HOILE, - - - - - - OSHKOSH.
C. WATERS, - - - - - - - VIROQUA.
C. H. GREENMAN, - - - - - MILTON.

NOMENCLATURE.

J. C. PLUMB, - - - - - - MILTON.
A. G. TUTTLE, - - - - - - BARABOO.
W. FINLAYSON, - - - - - - MAZOMANIE.
JOHN BARR, - - - - - - JEFFERSON.

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PREFACE.

THE Annual Meeting of the Wisconsin State Horticultural Society, at Madison, February 3–5, 1874, was the best attended and in many respects the most important meeting held by the Society since its organization. To the publication of the proceedings of this meeting—the addresses delivered, papers read, discussions held, fruit lists adopted—this volume is mainly devoted.

The society very properly gives its main attention to fruit growing, and to fruit growing by the masses of the people. The unparalleled injury to fruit trees and vines in the winter of 1872–73, and the consequent discouragement among the people, made the action of the society at its recent meeting especially important. In carefully prepared papers and reports, and in earnest discussion, a larger number of facts of value to fruit growers in Wisconsin than have ever before been collected were presented. With these to aid them intending fruit growers can plant trees with greater assurance of success than ever before.

The society also gives attention to encouragement of the cultivation of flower and vegetable gardens, shade, ornamental and timber trees. Each of these topics received appropriate attention in the transactions.

For more convenient reference the Addresses, Papers and principal Reports have been separated from the various transactions and discussions. The opinions expressed are those of individuals not of the Society unless expressly endorsed. Differences of opinion will be found, because none have perfect knowledge. Apparent conflict of facts will be found because we cannot know all the circumstances.

The varieties of fruits recommended are not designed to be planted indiscriminately. With all the facts attainable they are believed to be the best that can be recommended for use in most localities. Modified by local experience they will be of much value to planters.

The value of such volumes depends greatly on the promptness with which they are issued. This is especially true of the present volume, and the Horticulturalists of the State are to be congratulated on the fact that the State Printers have been able to issue it in time to be circulated and read before the season for planting opens.

G. E. MORROW,
Rec. Sec'y.

MADISON, WIS.

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LIST OF MEMBERS.

1874.

Adams, B. F..... Madison.
Adams, Isaac..... Door Creek.
Anderson, M..... Pine Bluff.
Andrews, Wm. W.. Cascade.
Aspinwall, J. C.... Oregon.

Bennett, Rev. P. S.. Appleton.
Benton, E. H..... Leroy.
Brainard, James... Oshkosh.

Crawford, A..... Clinton.
Cole, W. H..... Brodhead.

Daniells, Prof. W.W. Madison.
Davis, W. B..... Madison.

Finlayson, Wm.... Mazomanie.
Forster, W. J. C.... Milwaukee.

Greenman, C. H.... Milton.
Graves, S. W..... Rutland.

Ham, O. K..... Leeds Center.
Hambright, C. M.. Beaver Dam.
Hayes, Rev. J. M... West Salem.
Higgins, S. B.,..... Baxter, Iowa.
Hirschinger, Chas.. Baraboo.
Hoile, I. J..... Oshkosh.
Holt, M. A..... Madison.
Howie, John..... Waunakee.
Hoxie, B. S..... Cookville.
Hunt, Sam..... Evansville.

Innis, W. T..... West Rosendale.

Jennings, W. J..... Rosendale.

Kellogg, G. J..... Janesville.
Knight, E..... Sun Prairie

Lamb, S. C..... Waupun.
Lawrence, F. S..... Janesville.
Lewis, Sam'l..... Lake Mills.
Lund, Gen. N. F.... Madison.

Mason, Geo. A..... Madison.
Morrow, Geo. E.... Madison.
Mygatt, Dr. E. G... Richmond, Ill.

Palmer, N. N..... Brodhead
Parks, J. W..... Dodge's Corner.
Peffer, Geo. P..... Pewaukee.
Perry, Caleb..... Beaver Dam.
Plumb, J. C..... Milton.
Plumb, M. J..... Milton.

Ringrose, Geo. W.. Wauwatosa.
Robbins, Geo..... Mazomanie.

Sabin, R. B..... Sparta.
Scribner, Wm..... Rosendale.
Seymore, A. N... . Mazomanie.
Sherman, A..... Janesville.
Smith, J. M..... Green Bay.
Smith, J. Y..... Madison.
Stickney, J. S..... Wauwatosa.
Stiemfort, H..... Lake Mills.
Sumner, C. A..... Baraboo.

Thompsom, H. M... St. Francis.
Towers, W. P..... Madison.
Tuttle, A. G..... Baraboo.
Tuttle, A. C..... Baraboo.

Vasey, F. T..... Louisville.

Walters, C..... Springfield.
Wilcox, E..... Trempealeau.

HONORARY MEMBERS.

Life.—Dr. Joseph Hobbins, F. G. S. correspondent member Royal Horticultural Society, England, Madison; O. S. Willey, Madison.

Annual.—Hon. W. C. Flagg, Moro, Ill., Secretary American Pomological Society; P. A. Jewell, Lake City, Minn.; J. S. Harris, La Crescent, Minn.; L. Woodard, Marengo, Ill.

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NURSERYMEN, FLORISTS AND GARDNERS

OF WISCONSIN.

[An Incomplete List.]

Atwood, Isaac. gener'l nursery, Lake Mills.
Bæcher, John, florist, Milwaukee.
Baumgarten, florist, Milwaukee.
B ainerd, J., nursery, fruits and vegetables, Oshkosh.
Backhaus, G., veg'ble garden, Milwaukee.
Barney, J. B., apple trees, Mazomanie.
Brotherhood, Wm., veg. garden, Milwaukee.
Baker, J. A. & Co., apple trees, Durand.
Bell, R. G., general nursery, Black Earth.
Benton, E. H., Leroy.
Bennett & Briggs, Appleton.
Bush, Isador & Son, gen'l nur'y, Bushberry.
Butler & Holmes, general nursery, Sparta.
Barber, J., Miner plums, Lancaster.
Conger & Son, gen'l nursery, Whitewater.
Crawford Bros. & Co., general nursery, Waupaca and Chilton.
Clark, M. L., apple trees, New Lisbon.
Chase, Edmund, apple trees, Oshkosh.
Colwell, bedding plants, Janesville.
Carter, G. W. general nursery, Waterloo.
Dunlap, J. W. & Son, florist, Milwaukee.
Daniels, E. W., apple trees, Auroraville.
Daniels, Milwaukee.
Doyle, L. H., apple trees, Doylesville.
Edwards, Sam'l, Jr., forest evergreens, Green Bay.
Ellwood & Bro., gen'l nursery, Dodgeville.
Elmer, Ada, vegetable garden, Milwaukee.
Feldkamp, B., vegetable garden, Milwaukee.
Freytag, Jacob, florist, Milwaukee.
Fields, R. C., apple trees, Osseo.
Floyd, H., apple trees, Berlin.
Flint, W. S., apple trees, Princeton.
Flinn, H., apple trees, Watertown.
Freeborn & Hatch, apple trees, Ithaca.
Finlayson, W., gen'l nursery, Mazomanie.
Farr, A. W., forest evergreens, New London.
Felch, B. F., apple trees, Stevens Point.
Greenman, McGraw & Day. general nursery, Whitewater.
Gould Nursery, gen'l nur'y, Beaver Dam.
Greenman, C. H., grapes, Milton.
Gagan. P. & Co., apple trees and evergreens, Janesville.
Gewicke, Mrs., florist, Madison.
Gray, John W., crab trees, Trempealeau.
Gebhardt, Heinrich, florist and vegetable gardener, Milwaukee.
Goff, Richard & Co., nursery and small fruits, Waupun.
Hirschinger, C. H.. apple trees, Baraboo.
Hoppenrath, C., florist and vegetable gardener, Milwaukee.
Hortung, Michael, florist, Milwaukee.
Hæssler, Herman, florist, Milwaukee.
Hislop, dealer, green house, Milwaukee.
Hamilton, C. & Son, general nursery, Ripon.
Hargar, Balantine & Bro., general nursery, Bloomington.
Hoile. I. J., dealer, Oshkosh.
Hunt, S., apple trees, Evansville.
Howie, J. & W., apple trees, Waunakee.
Hake, D. A., apple trees, Jefferson.
Holt, M. A., general nursery, Madison.
Jewett, A. H., forest evergreens, Sparta.
Jones, A. P., florist, Fond du Lac.
Kæstner, C., vegetable gardener, Milwaukee.
Kitzrow, W., florist, Milwaukee.
Kellogg, G. J., general nursery, Janesville.
Loudon, F. W., general nursery, Janesville.
Lefeber, A., vegetable garden, Milwaukee.
Mars. C. & Son. veg. gardener, Milwaukee.
Mornbury, Frederick, florist, Milwaukee.
Middlemass, A., florist, Milwaukee.
Miles, Isaac, florist, Oshkosh.
Neferman, John. veg. garden, Milwaukee.
Osborn, J. H., green house, Oshkosh.
Œrtel, Louis, vegetable gardener, Milwaukee.
Pollard, Joseph, florist, Milwaukee.
Petty, J., gardener, La Crosse.
Plumb, J. C., general nursery, Milton.
Pinney & Co.. evergreens, Sturgeon Bay.
Palmer, R., Fond du Lac.
Peffer, G. P., general nursery, Pewaukee.
Putnam & Hutten, apple trees, Ash Ridge.
Palmer, N. N., general nursery, Brodhead.
Perkins, Josiah, apple trees, Prairie du Sac.
Reed, W., apple trees, North Prairie.
Roe, J. P., vegetables and grapes, Oshkosh.
Roberts, H. G., florist, Janesville.
Richardson, Mrs. J. B., general nursery, Sheboygan Falls.
Rote, Lewis, general nursery, Monroe.
Steinfort, general nursery, Lake Mills.
Smith, J. M., vegetable garden, Green Bay.
Stickney & Baumbach, general nursery, Wauwatosa.
Smith, Gustave, veg. garden, Milwaukee.
Sasse, Ferdinand, florist, Milwaukee.
Scherz, Geo., florist, Milwaukee.
Schmoldt, Herman, florist, Milwaukee.
Scherrmacher, C. W., florist, Milwaukee.
Sabin, R. B. & Co., gen'l nur'y, Sparta.
Sparks, H. S., Trempealeau.
Smith, G. N., cranberry plants and seeds, Berlin.
Smith, G. E., grapes and vegetables, Berlin.
Swain, S. G., apple trees, Baraboo.
Strever, W., green house, Oshkosh.
Seymour, A. N., apple trees, Mazomanie.
Thompson, H. M., gen. nursery, St. Francis.
Twist, L. & Son, apple trees, Loganville.
Tuttle, A. G., general nursery, Baraboo.
Telfer, A., Elroy.
Thomann, Casper, florist, Milwaukee.
Thiedmann, Wm., veg. garden, Milwaukee.
Tinker, John, apple trees, Clinton.
Treat, R. C., cranberries, Princeton.
Tubbs, J. L. Elkhorn.
Uecke, Jno., forest evergreens, Green Bay.
Vecke, J., Green Bay.
Vasey, F. T., general nursery, Louisville.
Warner, apple trees, Baraboo.
Wetting, John, veg. gard'n'r, Milwaukee.
Wilms, John C., veg. gard'n'r, Milwaukee.
Whitnall & Ellis, florists, Milwaukee.
Wiesner, Frederick, florist, Milwaukee.
Wilam, J. C., florist, Milwaukee.
Williams, J., florist, Milwaukee.
White, Albert, apple trees, Mauston.
Wilcox, E. & Son, apple trees, Trempealeau.
Waite, M. C., dealer, Baraboo.
Waters, Charles, apple trees, Springville.
Williams, J. E., florist, Madison.
Wilcox, J. & Son, Omro.

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FRUIT LISTS.

(*Adopted by Society February*, 1874.)

APPLES.

Five Varieties Hardiness Only Test.—Tetofski, Duchess of Oldenburg, Haas, Plumb's Cider, Fameuse.

List For General Cultivation.—Tetofski, Duchess of Oldenburg, Haas, Plumb's Cider, Fameuse, Walbridge, Red Astrachan, Utter, Westfield Seek-no-Further, Ben Davis, Talman Sweet, St. Lawrence, Willow Twig, Pewaukee.

(*See Discussion—Pages* 171-175.)

GRAPES.

General List.—Delaware, Concord, Lindley, Wilder, Salem, Agawam, Janesville, Worden, Eumelan.

For Trial.—Israella.

RASPBERRIES.

For General Cultivation.—Philadelphia, Davison's, Thornless, Doolittle, Miami.

Fastollf and Brinkle's Orange, *if protected in winter.*

STRAWBERRIES.

For General Cultivation.—Wilson's Albany, Green Prolific.

For Trial.—Peak's Emperor, Charles Downing, Reed's Late Pine, Victory, Burn's New Pine, Boyden's No. 30, Arena.

(*Adopted in* 1878.)

Lack of time prevented revision of following lists. They are inserted as the action of the society at meeting in February, 1878.

PEARS.

For Trial.—Flemish Beauty, Ananas d'Ete, Early Bergamot, Bartlett, Swan's Orange, Seckel, Winter Nellis.

PLUMS.

For Trial.—Lombard, Imperial, Egg, Magnum Bonum, Hinkley (or Miner) ,Yellow Egg, Eldridge.

EVERGREENS.

For General Cultivation.—Norway Spruce, White Pine, Aerbor Vitæ, Scotish Pine, Balsam.

For Ornamental Planting.—Austrian Pine, Hemlock, Siberian Arbor Vitæ, Red Cedar.

For Timber.—European Larch.

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CONSTITUTION AND BY-LAWS,

Adopted at the Annual Meeting in February, 1868.

CONSTITUTION.

ARTICLE I.—This Society shall be known as the Wisconsin State Horticultural Society.

ARTICLE II.—Its object shall be the advancement of the science of Pomology and the art of Horticulture.

ARTICLE III.—Its members shall consist of *Annual* members paying an annual fee of one dollar; of *Life* members paying a fee of ten dollars at one time, and of *Honorary* members, who shall only be members of distinguished merit in horticultural or kindred sciences, or who shall confer any particular benefit upon the society, who may by vote be invited to participate in the proceedings of the Society.

ARTICLE IV.—Its officers shall consist of a President, Vice President, Recording Secretary, Corresponding Secretary, Treasurer and an Executive Board, consisting of the foregoing officers and the ex-President, and *three* members to be elected annually; five of whom shall constitute a quorum at any of its meetings.

In addition to the foregoing officers, the president and secretaries of all local societies shall be deemed *ex officio* members of the Executive Board.

All officers shall be elected by *ballot*, and shall hold their office for *one* year thereafter, and until their successors are elected.

ARTICLE V.—The society shall hold annual meetings, commencing on the first *Tuesday* of February, for the election of officers, for discussions, and for he exhibition of *fruits*; also, one meeting during the fall, for the exhibition of fruits, and for discussions, at such time and place as the Executive Board shall designate.

ARTICLE VI.—This Constitution may be amended at any regular meeting by a two-thirds vote of the members present.

BY-LAWS.

I. The President shall preside at meetings, and with the advice of the secretary, call all meetings of the society, and have a general superintendence of the affairs of the society, and shall deliver an annual address, upon some subject connected with horticulture.

II. The Vice President shall act in the absence or disability of the President, and perform the duties of the chief officer.

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III. The secretaries of local societies shall by correspondence and personal intercourse with the horticulturists of their respective districts obtain accurate information of the condition and progress of horticulture, and report to this society.

IV. The Corresponding Secretary shall attend to all the correspondence of the society.

V. The Recording Secretary shall record the proceedings of the society, preserve all papers belonging to the same, and superintend the publication of its reports.

VI. The Treasurer shall receive and keep an account of all moneys belonging to the society, and disburse the same on the written order of the President, countersigned by the secretary, and shall make an annual report of receipts and disbursements.

VII. The Executive Board may, subject to the approval of the society, manage all its affairs, and fill vacancies in the board of officers; three of their number, as designated by the President shall constitute a finance committee.

VIII. It shall be the duty of the finance committee to settle with the treasurer, and to examine and report upon all bills or claims against the society, which may have been presented and referred to them.

TIMBER BELTS.

Chapter 102—*General Laws* 1868.

AN ACT to encourage the planting and growth of trees, and for the protection thereof.

The people of the state of Wisconsin, represented in Senate and Assembly, do enact as follows:

SECTION 1. Every land owner or possessor of five acres of land or more, who shall reserve from the natural growth, or shall successfully grow by planting not to exceed one-fifth part thereof in forest trees, in the form of tree belts, as hereinafter described, shall be entitled to have the land on which such trees grow exempted from taxation from the time the said trees commence to grow, if planted by the owner, until the trees shall reach the height of twelve feet. Whenever the trees shall have attained the height of twelve feet, he shall be entitled to receive an annual bonnty of two dollars per acre for each acre so planted or grown as a tree belt, which bounty shall be allowed him as hereinafter provided; and the certificate therefor shall be received by the collector of taxes assessed on the entire land of which the tree-belt forms a part, as so much cash.

SECTION 2. Tree-belts, to be entitled to the benefit of this act, shall be reserved or planted on the west or south sides of each tract of land, and shall be not less than thirty feet wide; but no tree-belt shall exceed one-fifth par

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of the entire tract of land on which the same is planted: *provided*, that if the the east and north sides of any tract of land, or either of them, be bounded by a public highway or street, then a tree-belt one rod wide may be planted next to said highway or street, and the same shall be entitled to all the benefits of this act, although such last mentioned tree-belt shall, with the other tree-belts on the west and south sides exceed the one-fifth part of the whole of said tract of land. The tree-belts may be composed of any or all of the following kind of trees, or such species thereof as will grow to the height of fifty feet or more, viz.: arbor vitæ, ash, balsam fir, basswood, beech, birch, butternut, cedar, black cherry, chestnut, coffee tree, cucumber tree, elm, hackberry, hemlock, hickory, larch, locust, maple, oak, pine, spruce, tulip tree and walnut. All belts shall be of equal width throughout their entire length, and contain not less than eight trees standing at nearly equal distances from each other, on each square rod of land.

SECTION 3. Tree-belts, to be entitled to the benefits of this act, for each five acres of land must be at least thirty feet wide; for each ten acres of land at least sixty feet wide, and for forty square acres at least one hundred feet wide, and must be on two sides of each square tract of land; and all tree-belts owned by the same land owner must be planted not to exceed one-fourth of a mile apart, or on the west and south sides of every forty square acres of land; and the tree-belts may be divided and planted or reserved on any other lines with each forty square acres, by the permission of the assessor.

SECTION 4. Whenever any person after having applied for and obtained a bounty certificate for a tree-belt, shall allow such tree-belt to die out by want of culture or otherwise, or shall cut down the same, or shall pasture the same lands with his cattle or animals, or shall so thin out the tree-belts that, in the opinion of the aesessor, it shall no longer be entitled to receive the annual bounty hereby offered, or to have the land exempted from taxation, he shall lose all benefit of this act until it shall again be accredited and certified to by the assessor.

SECTION 5. It shall be the duty of the assessor, upon application of the owner, each year, at the time of assessing the personal property in his district, to ascertain by personal examination of all tree-belts for which exemption from taxes or bounties is claimed, and by inquiries whether the belts have been reserved or planted, and are thriftily growing, as required by this act; and if he shall be satisfied that they are not so growing, or that the owner has allowed his cattle and animals access to the tree belts, or that he has cut down or thinned out the same so as to destroy their capacity as a wind-break, he shall assess the land for taxes, and shall refuse to grant any certificate showing that the owner is entitled to a bounty thereon.

SECTION 6. This act shall take effect and be in force from and after its passage and publication.

Approved March 4, 1868.

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PREMIUMS AWARDED

IN

FRUIT AND FLOWER DEPARTMENT

AT

WISCONSIN STATE FAIR, SEPT., 1873.

Class 30.—Fruits by Professional Cultivators.

APPLES.

Greatest variety of apples, G. P. Peffer, Pewaukee	$10 00
Second best, Gould Nursery, Beaver Dam	7 50
Third best, Geo. J. Kellogg, Janesville	5 00
Fourth best, Geo. Wolff, Thiensville	3 00
Best ten varieties adapted to the northwest, G. P. Peffer, Pewaukee	10 00
Second best, Geo. J. Kellogg, Janesville	7 50
Third best, Gould Nursery, Beaver Dam	5 00
Best five varieties adapted to the northwest, G. J. Kellogg	5 00
Second best, G. P. Peffer	3 00
Third best, C. H. Greenman, Milton	2 00
Best and greatest varieties of winter apples, Geo. J. Kellogg.	10 00
Second best, G. C. Peffer	7 50
Third best, Gould Nursery	5 00
Best five varieties winter apples, C. H. Greenman, Milton	5 00
Second best, G. P. Peffer	3 00
Third best, Geo. J. Kellogg	2 00
Best plate Red Astrachan, G. P. Peffer	2 00
Second best, Geo. Wolff	1 00
Best plate Duchess of Oldenburg, G. P. Peffer	2 00
Second best, Geo. J. Kellogg	1 00
Best plate St. Lawrence, G. P. Peffer	2 00
Second best, Geo. J. Kellogg	1 00
Best plate Fameuse, G. P. Peffer	2 00
Second best, Geo. J. Kellogg	1 00
Best plate Utters, G. P. Peffer	2 00
Second best, Geo. J. Kellogg	1 00
Best plate Plumb's Cider, G. P. Peffer	2 00
Second best, Geo. J. Kellogg	1 00
Best plate Seek-no-Further, G. P. Peffer	2 00
Second best, Geo. Wolff	1 00
Best plate Willow Twig, Geo. J. Kellogg	2 00
Best plate Ben Davis, G. P. Peffer	2 00
Second best, Geo. J. Kellogg	1 00
Best plate Talman Sweet, Geo. J. Kellogg	2 00
Second best, G. P. Peffer	1 00
Best plate Golden Russet, G. P. Peffer	2 00
Second best, Geo. J. Kellogg	1 00
Largest apple, G. P. Peffer	1 00
Second, Geo. Wolff	50
Heaviest apple, G. P. Peffer	1 00
Second, Geo. Wolff	50

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PEARS.

Best and greatest variety, G. P. Peffer	7 50
Second best, Gould Nursery	4 00
Third best, G. J. Kellogg	2 50
Fourth best, Geo. Wolff	1 00
Best three varieties, Geo. Wolff	3 00
Second best, G. P. Peffer	2 00
Best Flemish Beauty, G. P. Peffer	3 00
Second best, Geo. Wolff	2 00

PLUMS.

Greatest variety, G. P. Peffer	3 00
Second best, Geo. Wolff	2 00
Best Miner C. H. Greenman, Milton	1 00
Second best, G. J. Kellogg	50
Best native or wild, G. P. Peffer	2 00
Second best, Geo. J. Kellogg	1 00

PEACHES.

Best show of named fruit, G. P. Peffer	2 00

GRAPES.

Best and greatest variety, Geo. J. Kellogg	$7 50
Second best, C. H. Greenman	5 00
Best five varieties, C. H. Greenman	5 00
Second best, Geo. J. Kellogg	3 00
Third best, Geo. P. Peffer	2 00
Best three varieties, Geo. J. Kellogg	3 00
Second best, C. H. Greenman	2 00
Third best, G. P. Peffer	1 00
Best two varieties, C. H. Greenman	2 00
Second best, Geo. J. Kellogg	1 00
Best single variety, G. P. Peffer	3 00
Best three bunches Concord on one cane, Geo. J. Kellogg	1 00
Best three bunches Delaware on one cane, C. H. Greenman	1 00
Best single variety, quality to rule, Geo. J. Kellogg	5 00
Best show foreign, Mrs. Alexander Mitchell	3 00
35 varieties apples on one tree, G. J. Kellogg	Commended.
Plate Harvest apples, M. Robinson, Wauwatosa	Commended.

F. S. LAWRENCE,
F. C. CURTISS,
J. M. SMITH,
J. W. PARK,
Committee.

Class 31.—*Fruits by Non-Professional Cultivators.*

APPLES.

Best and greatest variety, J. C. Ackers, Elkhorn	$10 00
Second best, E. B. Thomas, Dodge's Corners	7 50
Third best, J. W. Park, Dodge's Corners	5 00
Fourth best, Geo. Jeffrey, Five Mile House	3 00
Best ten varieties adapted to the northwest, B. B. Olds, Clinton	10 00
Second best, S. Lewis, Lake Mills	7 50
Third best, Geo. Jeffray, Five Mile House	5 00
Best ten varieties, without regard to adaptation, James Ozane, Somers.	5 00
Second best, J. C. Ackers, Elkhorn	3 00
Third best, J. W. Park, Dodge's Corners	2 00
Best five varieties adapted to the northwest, D. Huntley, Appleton	5 00
Second best, Geo. Jeffrey, Five Mile House	3 00
Third best, S. Lewis, Lake Mills	2 00

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Best and largest variety of winter, J. C. Ackers, Elkhorn..... 10 00
Second best, J. W. Park, Dodge's Corners..... 7 50
Third best, Thomas Bones, Racine..... 5 00
Best five varieties of winter, Wm. Reed, North Prairie..... 5 00
Second best, S. A. Tenney, Durham Hill..... 3 00
Third best, Thomas Bones, Racine..... 2 00
Best plate Red Astrachan, E. B. Thomas, Dodge's Corners..... 2 00
Second best, J. C. Ackers, Elkhorn..... 1 00
Best plate Duchess of Oldenburg, D. Huntley, Appleton..... 2 00
Second best, Geo. Jeffrey, Five Mile House..... 1 00
Best plate Fameuse, Luther Rawson, Oak Creek..... 2 00
Second best, S. Lewis, Lake Mills..... 1 00
Best plate St. Lawrence, Luther Rawson, Oak Creek..... 2 00
Second best, S. Lewis, Lake Mills..... 1 00
Best plate Utters, Mrs. A. A. Boyce, Lodi..... 2 00
Best plate Plumb's Cider, S. Lewis, Lake Mills..... 2 00
Best plate Seek No Further, D. T. Pilgrim, West Granville..... 2 00
Second best, Wm. Reed, North Prairie..... 1 00
Best plate Talman Sweet, J. W. Park, Dodge's Corners..... 2 00
Second best, Wm. Reed, North Prairie..... 1 00
Best plate Golden Russet, G. W. Ringrose, Wauwautosa..... 2 00
Second best, Wm. Reed, North Prairie..... 1 00
Best plate Willow Twig, S. Lewis, Lake Mills..... 2 00
Second best, E. B. Thomas, Dodge's Corners..... 1 00
Best plate Ben Davis, J. C. Ackers, Elkhorn..... 2 00
Second best, S. Lewis, Lake Mills..... 1 00
Largest apple, J. W. Park, Dodges Corners..... 1 00
Second, Daniel Goelser, Paynesville..... 50
Heaviest apple, S. A. Tenny, Durham Hill..... 1 50
Second, Daniel Goelser, Paynesville..... 50

PEARS.

Best and greatest variety, E. B. Thomas, Dodge's Corners..... 7 50
Second best, J. W. Park, Dodge's Corners..... 4 00
Third best, J. Ozane, Somers..... 2 50
Fourth best, J. L. Pierce, Milwaukee..... 1 00
Best 3 varieties, J. Ozane, Somers..... 3 00
Second best, E. B. Thomas, Dodge's Corners..... 2 00
Best Flemish Beauty, S. Lewis, Lake Mills..... 3 00
Second best, R. H. Sabin, Milwaukee..... 2 00

PLUMS.

Best Miner..... 1 00
Best native or wild, S. Lewis, Lake Mills..... 2 00
Second best, Wm. Reed, North Prairie..... 1 00

GRAPES.

Best and greatest variety, F. S. Lawrence, Janesville..... $7 50
Second best, Wm. Reed, North Prairie..... 5 00
Third best, S. Lewis, Lake Mills..... 3 00
Fourth best, E. B. Thomas, Dodge's Corners..... 2 00
Best five varieties, Wm. Reed, North Prairie..... 5 00
Second best, F. S. Lawrence, Janesville..... 3 00
Third best, S. Lewis, Lake Mills..... 2 00
Best three varieties, Wm. Reed, North Prairie..... 3 00
Second best, S. Lewis, Lake Mills..... 2 00
Third best, E. B. Thomas, Dodge's Corners..... 1 00
Best two varieties, Wm. Reed, North Prairie..... 3 00
Second best, S. Lewis, Lake Mills..... 1 00
Best single variety (Delaware), E. B. Thomas, Dodge's Corners..... 1 00
Best three bunches Concord on one cane, Wm. Reed, North Prairie..... 1 00
Best three bunches Delaware on one cane, Wm. Reed, North Prairie..... 1 00
Best single variety, quality to rule, E. B. Thomas, Dodge's Corners..... 5 00

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CRABS.

Best variety, Wm. Reed, North Prairie $2 00
Second best, D. T. Pilgrim, West Granville..... 1 00
Best plate Hyslop, D. T. Pilgrim, West Granville 1 00
Best plate Transcendent, S. Lewis, Lake Mills 1 00
Best seedlings, S. Lewis, Lake Mills 2 00
Second best, Wm. Reed, North Prairie..... 1 00
Show of apples on branches, John Baker ..... Commended.

GEO. J. KELLOGG,
GEO. P. PEFFER,
HAYDEN M. THOMPSON,
A. G. TUTTLE,
H. H. GREENMAN,
Committee.

Class 32.—Sweepstakes on Fruits.

Best collection of fruit of all kinds by professional and non-professional cultivators, Geo. P. Peffer, Pewaukee..... 7 50
Second best, J. G. Kellogg, Janesville 5 00

C. M. HAMBRIGHT,
JAMES BRAINERD,
A. A. BOYCE,
Committee.

Class 33.—Nursery Trees.

Best collection deciduous nursery grown trees, Stickney and Baumbach, Wauwatosa.....$10 00
Best collection of evergreens, Geo. J. Kellogg, Janesville 10 00
Second best. Stickney & Baumbach, Wauwatosa..... 5 00
Best collection of fruit trees, Gould Nursery, Beaver Dam 10 00
Second best, H. M. Thompson, St. Francis..... 5 00
Best collection of hardy flowering shrubs, Stickney & Baumbach, Wauwatosa..... 3 00
Second best, H. M. Thompson, St. Francis..... 2 00
Best collection hardy ornamental hedge plants, Stickney & Baumbach, Wauwatosa 3 00

I. J. HOILE,
E. B. THOMAS,
WM. REID,
Committee.

Summer Fruits.

Plantation of currants, R. H. Sabin, Milwaukee.
Plantation of raspberries, R. H. Sabin, Milwaukee.
Plantation of strawberries, R. H. Sabin, Milwaukee.

J. S. STICKNEY,
O. S. WILLEY,
Committee.

Class 34.—Flowers by Professional Cultivators.

Best floral design, A. Middlemass, Milwaukee.....$10 00
Best collection cut flowers, Wm. Kitzrow, Milwaukee..... 5 00
Best basket of cut flowers, G. W. Dunlop, Milwaukee..... 3 00
Best pyramidal bouquet, G. W, Dunlop, Milwaukee..... 3 00
Best pair round boquets, G. W. Dunlop, Milwaukee..... 3 00
Best pair flat boquets, G. W. Dunlop, Milwaukee 2 00
Best bouquet everlasting flowers, Wm. Kitzrow, Milwaukee 3 00
Best display dahlias, Wm. Kitzrow, Milwaukee..... 5 00
Best ten named dahlias, Wm. Kitzrow, Milwaukee..... 3 00
Best display of roses, Wm. Kitzrow, Milwaukee..... 5 00
Second best, J. W. Dunlop, Milwaukee..... 3 00

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Best display named verbenas, Wm. Kitzrow, Milwaukee..... 3 00
Best ten named verbenas, Wm. Kitzrow, Milwaukee..... 2 00
Best show of asters in quality and variety, H. G. Roberts, Janesville.. 2 00
Best show petunias, H. G. Roberts, Janesville..... 1 00
Best show dianthus, H. G. Roberts, Janesville..... 2 00
Best show gladiolas, H. G. Roberts, Janesville..... 2 00
Best show greenhouse plants, Wm. Kitzrow, Milwaukee..... 10 00
Second best, A. Middlemass, Milwaukee..... 5 00
Best twenty varieties greenhouse plants in bloom, Wm. Kitzrow, Mil.. 10 00
Show greenhouse plants, A. Middlemass, Milwaukee.....
Best ten geraniums, Wm. Kitzrow, Milwaukee..... 5 00
Best six fuschias, Wm. Kitzrow, Milwaukee..... 3 00
Best six carnations, Wm. Kitzrow, Milwaukee..... 2 00
Best display of flowers raised by exhibitor, Wm. Kitzrow, Milwaukee. 10 00
Best display ornamental foliage plants, Wm. Kitzrow, Milwaukee 5 00

DR. M. RISCH,
MRS. F. S. LAWRENCE,
J. POLLARD,
Committee.

Class 34—James Vick's Special Premiums.

Best and finest collection cut flowers, Miss Kate Peffer, Pewaukee....$20 00
Best collection phlox drummondii, Mrs. C. C. Kingsley, Milwaukee.. 10 00
Best collection asters, M. Dresser, Kenosha..... 10 00
Best collection balsams, Mrs. E. B. Thomas, Dodge's Corners..... 10 00
Best collection dianthus family, M. Dresser, Kenosha..... 10 00
Best collection pansies, D. Huntly, Appleton 10 00
Best collection stocks, Miss Kate Peffer, Pewaukee 10 00
Best collection everlasting flowers and grasses, Mrs. E. B. Thomas, Dodge's Corners 10 00

FLOWERS GROWN BY PERSONS UNDER TWENTY YEARS OF AGE.

Best collection cut flowers, Dora Park, Dodge's Corners..... 10 00
Best collection phlox drummondii, Dora Park, Dodge's Corners 5 00
Best collection asters, Dora Park, Dodge's Corners 5 00
Best collection dianthus family, Dora Park, Dodge's Corners..... 5 00
Best collection stocks, Dora Park, Dodge's Corners 5 00
Best collection gladiolas, Dora Park, Dodge's Corners 5 00
Best collection everlasting flowers and grasses, Dora Park, Dodge's Corners 5 00

D. W. C. PRIEST,
MRS. F. S. LAWRENCE,
I. POLLARD.
Committee.

Class 35.—Flowers by Non-Professional Cultivators.

Best floral design, Henry Gephart, Milwaukee.....$10 00
Second best, Sarah Bodtker. 5 00
Best collection cut flowers, Kate Peffer, Pewaukee 5 00
Second best, Miss I. G. Munger, Dodge's Corners..... 3 00
Best basket of flowers, Miss I. G. Munger, Dodge's Corners 3 00
Second best, Mrs. J. W. Park, Dodge's Corners 2 00
Best pyramidal bouquet, Miss Kate Peffer, Pewaukee..... 3 00
Best bouquet everlasting flowers, Mrs. S. B. Smith, Big Bend..... 3 00
Best display dahlias, Miss Kate Peffer, Pewaukee..... 5 00
Best ten named dahlias, Miss Kate Peffer, Pewaukee..... 3 00
Display of roses, Mrs. S. B. Smith, Big Bend..... 3 00
Best show seedling verbenas, Miss I. G. Munger, Dodge's Corners 2 00
Best show asters, in quality and variety, M. Dresser, Kenosha 2 00
Second best, Mrs. S. B. Smith, Big Bend 1 00
Best show perennial phlox, Miss I. G. Munger, Dodge's Corners..... 1 00

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Best show pansies, Mrs. S. B. Smith, Big Bend..... 1 00
Best show petunias, Miss I. G. Munger, Dodge's Corners..... 1 00
Best show dianthus, M. Dresser, Kenosha..... 2 00
Best show gladiolas, Kate Peffer, Pewaukee..... 2 00
Best show greenhouse plants, H. W. Roby, Milwaukee..... 10 00
Second best, J. H. Walker, Milwaukee..... 5 00
Best 20 varieties greenhouse plants in bloom, H. W. Roby, Milwaukee. 10 00
Best show ornamental foliage plants, J. H. Walker, Milwaukee..... 5 00

DR. R. A. KOSS,
MRS. D. HUNTLEY,
O. S. WILLEY,
H. G. ROBERTS,
Committee.

Class 36.—*Flowers by Professional, Non-Commercial Cultivators.*

Best floral design, Mrs. Alex. Mitchell, Milwaukee.....$10 00
Second best, Robt. Allen, Milwaukee..... 5 00
Best show greenhouse plants, Mrs. Alex. Mitchell, Milwaukee..... 10 00
Second best, Robt. Allen, Milwaukee..... 5 00
Best 20 varieties greenhouse plants in bloom, Mrs. Alex. Mitchell, Mil. 10 00
Best 10 Geraniums, Robt. Allen, Milwaukee.

SPECIAL PREMIUM.

Lignarium, Q. W. Church, Prospect Hill.....$15 00

O. S. WILLEY,
MRS. D. HUNTLEY,
H. G. ROBERTS,
Committee.

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ADDRESSES AND PAPERS

BEFORE THE

WISCONSIN

STATE HORTICULTURAL SOCIETY,

AT THE

ANNUAL MEETING

AT

Madison, February 3, 4 *and* 5, 1874.

ANNUAL ADDRESS BY THE PRESIDENT.

J. S. STICKNEY, WAUWATOSA.

Gentlemen of the State Horticultural Society: As the revolving year brings together legislators to mend our laws; politicians to see that the country is saved; teachers to care for our educational interests; clergymen to improve our theology; agriculturists to keep up the supply of those products which are the foundation of all our prosperity: So are we brought together to discuss the results of our year's labor, and devise ways and means for future improvement.

In earlier days our numbers were few and our discouragements great; but now we are numerically strong, and are accustomed to speak with confidence of what we have done and can do.

The outside world looks confidingly to us and our proceedings, with the full expectation that we shall be able to tell them all

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about it; that henceforth, to them, the road to horticultural success will be made plain and easy.

Occupying this high position, may we not congratulate ourselves that we are horticulturists? That by our careful study and observations we have mastered the situation, and are able to command success: That we can say to the Codling Moth, depart from our orchards, and hereafter content thyself with the seeds and juices of the wild crab: That in future, the Curculio must, like the rest of us, work for his living, by puncturing the thick covering of the native plum, or for extra penance have to seek subsistence from the Hinkley: That blight in all its forms is to harm us no more; and luscious pears are now to be as plenty as apples: That our late inventions in the way of ironclads, have successfully stood the test, and hereafter, degrees of heat or cold will not affect our supply of choice fruits: That those horticultural treasures, the Siberians, with their Captain and King, the Soulard, are yearly becoming more abundant, and more excellent, so that very soon they will be within the reach of all and we shall have no further use for common apples: That our homes are models of ornamental planting, whose beauty shall cultivate and improve the taste of all who see them: That in imitation of our wise example, timber belts and groups of beautiful trees will spring up on the farm; that every home will have its extensive orchard, its fruit garden, and its well kept lawn; that the kitchen garden will no longer be the unsightly home and nursery of weeds, but will yield bountifully of every good thing in its season; that the principles applied here, shall be exteded to the broad acres of the farm until their products shall be doubled, yea, quadrupled?

It adds to one's happiness, to look always on the sunny side of things, and if in my complacent mood I have somewhat overdrawn this picture, you will pardon the exaggerations and heartily join me in wishing they were true.

The lessons of the past year have been severe. Our fine theories have been torn to shreds. Our extended fruit lists have been fearfully cut down. Our plans of to-day must differ widely from those of a year ago. But into our future should come no thought of planting a tree or a vine less, or being less fully supplied with every luxury that the orchard and garden can yield.

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In this, as in every other thing, we must accept and make the most of things as they are. Nature's laws are beyond our control. We can change, and adapt ourselves to them; and instead of a groan or a grumble at our losses, we should study earnestly the lesson so forcibly brought home to us, that we may not only learn, but remember all that it teaches.

Wherein does the lesson of last winter differ from that of 1856? Then we had been for years planting anything and everything that the eastern nurserymen sent us; and the weeding out of everything unfit for this climate was thorough and complete.

As far as we have again planted those tender kinds, this lesson is an exact repetition of the old; and but for the presence of the extra hardy kinds, this would have been just as severe. We see the results of that former lesson in our improved Siberians, and our Tetofski, Duchess, Walbridge, Pewaukee, Haas, and others, which then were scarcely known, or at least not appreciated.

Had our memories served us better, and our faith in a few delusively mild winters been less, last winter's severity would have been harmless. It is true that many of our iron-clads, and even Siberians were killed, but the injury was at the roots, while the tops were unharmed, and the causes of this root killing being largely within our control, it can and must be prevented.

Knowing that these severe winters must frequently come, and that the planting of anything less than iron-clads will only bring loss and disappointment, let us search earnestly for every good and hardy kind. Let us put forth new energy in the production of new varieties from seed. Let us, in our discussions, consider all the causes of our root killing and devise ways and means to prevent it. This course, persistently followed, will give us as many valuable additions as did the losses of 1856, and thus convert this seeming loss into a positive gain.

Doubtless, many a rash resolve has been made during the past summer to waste no more time or money in tree planting. This, though very natural, is very unwise, and is just as hurtful in its effects when applied to fruit growing, as it would be if applied to grain growing. True, the disappointment has been greater, than from the failure of a grain crop, because the time is longer from the planting to the maturity of the tree, but this, instead of being

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a reason for not planting at all, is the very strongest reason for replanting immediately.

Every year of hesitation now, puts the supply of fruit a year further off, and he who believes he can see his neighbors and friends growing and enjoying these things, and not sooner or later break these unwise resolutions, must think his a very peculiar kind of human nature.

This failure of many large fruits, once more reminds us of the great value and importance of a full supply of small fruits. Such of these as are not entirely hardy are so easily protected as to render them always a certainty. These suggestions, in a more or less extended form, I have so often made, that you may very properly suspect me of having but this one idea, and indeed I believe this one idea, well developed and carefully worked out would give me more than an average supply, both of fruit and "daily bread."

In looking through various nurseries, to note the effects of the winter, I have been surprised to see young pear trees suffering less than apples of the same age, owing, probably, to better maturity of wood, and possibly to deeper rooting. Whatever the cause, the fact is encouraging.

One very successful lot, standing on deeply trenched ground, would seem to illustrate the benefits of a deeper soil for pears. This, I think, our eastern friends have understood and practiced for years, while we have been slow to learn.

Two instances have this season come to my notice of good crops of very fine pears, on trees whose bodies and larger limbs were shaded on the south and west by smaller trees standing quite near them. These, with former observations confirm my belief that constant protection of the bodies on the south and west, both summer and winter, will do much to keep the trees thrifty and free from blight.

At the close of this year of general failure and disaster, I again hopefully urge, on this subject of pear growing, everything that I said in my address of a year ago. Good pears, and plenty of them we want and intend to have.

The past season's crop of Kentish cherries has been very abundant and very gratifying to us, confirming our full faith in this

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as being valuable to the very northern limits of any fruit culture. We never knew a tree to kill in root or branch from any winter severity. The tree is of slow growth, and rather scrubby in appearance, but being on its own roots, it suffers nothing from tender stocks, and as it comes to maturity will surely win its way to favor.

Speaking of or our progress, may bring to mind the frog in the well, yet each one of us can doubtless think of many things, which though not of much importance to be of general interest, will in the aggregate, make this year one of real progress.

The best of these experiences, our discussions, will put in a form to be useful to all who will carefully consider and practice them.

As to our future work, it is certainly abundant, and so varied that each may choose that which best suits his taste. We need more hardy, long keeping apples: more light on best varieties and best treatment of pears and plums: more effectual remedies for Codling Moth, Curculio and Blight. We have yet to find that good and hardy blackberry, about which we have heard so much and seen so little, and that effectual hedge-plant for this latitude. We want a better knowledge of, and greater interest in ornamental and timber planting, particularly of the evergreens; increased interest in home adornments; more and better flower and vegetable gardens.

These are our most urgent wants, and while seeking these, we must also seek a more extended and general influence with the people who grow and need these things, that we may encourage them to plant more extensively, and plant the best.

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RECREATION IN HORTICULTURE.

AN ADDRESS BY HON. ED. SEARING,
State Superintendent of Public Instruction.

Happy is the man who finds delight in external nature, who sees and is moved by beauty in trees and fields, in brooks and clouds. He is happy, for the sources of his enjoyment are easily and abundantly at his service. Nature gives him perpetual and ever varying pleasure. As man is placed amid such endless variety of natural objects, adapted to give him pleasure and instruction, every principle of self advantage should lead him to the cultivation of his powers of observation and appreciation of what is about him. The eye that catches not beauty and inspiration from the external world is like that which is unable to get wisdom or delight from the printed pages of books. It is equally man's duty and privilege to cultivate his perceptions so that he may obtain the utmost good from the printed records of others' thoughts, and the unconventional creations of nature around him.

Yet the beauties of the external world are largely unseen and unstudied by the majority of our people. The farmers who live in the midst of rural scenes are either too much uncultured or too much occupied with severe labor to appreciate and use what is about them. Professional and business men are too exclusively given up "to addition to themselves and substraction from their neighbors," to find time for the enjoyment of aught else, and are moreover largely shut up in cities and towns whence they get only occasional and hasty glimpses of country scenes.

I plead to night for a larger liberty for both classes. Man shall not live by bread alone. Both soul and body, in city and country, need fuller and wiser recreation. There should be more of the country in the city, and more of the city in the country, and more leisure and inclination for rational enjoyment in both.

The farmer, whose composition is such that he can work only with his hands, and not also with his head, is a slave to his busi-

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ness—in utter and irremediable bondage from the beginning to the end of his career. Work tyrannizes over him. He is a slave because of his ignorance—because of his poverty, because of his ignoble surroundings, because of his hopelessness. Dwelling in midst of a possible paradise, he makes it, by his ignorance and his blindness, an actual desert. He sees nothing in a tree but firewood, nothing in green grass but food for his horse or ox, nothing in a stone but an impediment to his plow or hoe, nothing in clouds but harbingers of rain or drought for his fields, nothing in birds but troublesome enemies which steal his substance.

For such farmers—and their name is legion—there can be little true and ennobling recreation.

This should not, and need not be so. I ask as a remedy a liberal education for farmers—an education both disciplinary and technical. There is no wider, no nobler field to-day for educated faculties than agriculture or horticulture. To know all the circumstances best adapted to the growth of a grain, a grass, a tree or a shrub; to study and forecast the markets of the world as does the successful merchant, so that he may know where to purchase for the least and sell for the highest price, and may know what crops will pay him best; to keep his accounts with the accuracy and fullness of that same merchant, so that he shall know the cost and the profit of every crop he grows, every animal he sells, every investment he makes; to have the wisdom and the courage to cut off unnecessary expenses; to know how to plan for the future as well as act effectively in the present; to know how best to husband and preserve his resources in stock, in machinery, and in buildings, wisely *providing against accidents*, so as to *prevent* the most and to skillfully remedy the few; to make the labor of his brain limit to the minimum the labor of his hand, by carefully planning in his leisure the work of his busy days; to have a taste for the beautiful in nature and art, so that he may invest his home with those delights and comforts which need for their creation not so much a well-filled purse, as a cultivated eye and brain; to have a taste for reading, so that his leisure may be partly given to that recreation which combines instruction with pleasure; and last, but not least, to make a home for his children which shall be worthy of the name and of them—a home full of attractions and

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delights, which it shall be hard for them to leave and undesirable to forget—these are some of the qualifications a true farmer needs. They are not overdrawn. They are such as some possess, but such as the majority lack.

I plead for a higher education of farmers. I have not only the greatest possible respect for their calling, but a strong personal attraction to it. I was brought up on a farm, have always had farmers for my neighbors and friends, am fully half a farmer myself by right of both birth and experience. I know the hard facts of a farmer's life, and I equally know its pleasant possibilities. It cannot be necessary that the calling which lies at the very basis, not only of national prosperity, but of national existence; which brings man more intimately in contact with nature than does any other; which has been the delight of some of the greatest and wisest of men; and has afforded a theme for the highest poetic genius in all ages since Theocritius and Virgil,—it cannot be necessary that this calling should be limited and degraded by conditions so servile as now too often prevail. To put in more freedom, more liberal living, more profit, more honor, I would have farming one of the learned professions. And I believe the day has already come with us when true success in agriculture or horticulture is the result only of intelligence and skill.

You know a child is "pleased with a rattle, tickled with a straw." The soberness of more mature age cannot be thus moved. So it is with the soil of our country. Some years ago, in its virgin infancy, when even slightly "tickled with the plow it laughed with the harvest." Now the most persevering efforts at mere "tickling" are seldom rewarded with more than a "smile" in the way of crops. That is, the conditions are changed. The superabundant fertility is gone. Skill must now effect the results which rude labor once produced. And ,as a consequence of this, he who is hereafter to be a truly successful farmer, must be a truly intelligent farmer. I repeat, I plead for a higher education of farmers. They ought to be men of generous culture, with keen intelligence to see what is wisest, truest, best, amid a multitude of conflicting or uncertain conditions; with cultivated taste to make their surroundings beautiful and attractive; with a love for literature and science that they may enjoy recreation during the inter-

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vals of labor, in that which shall be instructive to themselves and their families.

When there is so great need of reform in this respect—when agriculture and horticulture ought to be reduced to a science, and not be a mere series of uncertain and blundering experiments, what is the duty of those who see the defects? It is plainly in the first place to show those engaged in these employments, what their higher success demands; to give them a consciousness of their needs; and, in the second place, to afford them opportunities for supplying these wants. The agricultural and horticultural press, and agricultural schools, are striving to show the need and to supply it. The former is doing a largely successful and beneficial work. The latter are doing far less than they ought; are in fact exerting only a trifling influence upon the agricultural interests of the country. They appear, to an outsider, to be well equipped with everything except students. Why is it that the agricultural department of our own University is not filled by them to its limits? Agriculture and horticulture cry aloud for the benefits which such institutions should furnish, and for aught I know, do offer to those who do not come.

O that some great apostle of agriculture might arise from the bones of dead methods to lead our young men to a high enthusiasm, and thorough preparation for the divine work of co-operation with nature in adding to the fertility and beauty of the earth! Would that an agricultural Agassiz might come to found a school of farming and horticulture on a new Penikese, drawing to him by the superiority of his knowledge and the magnetism of his presence, disciples from every state of our broad Union. There is need of such—great and increasing need. The honored Agassiz, who has gone, ministered simply, or mostly, to the world's curiosity. Like explorers in Arctic seas, or in African wilds, he added to the boundaries of human knowledge, but contributed little or nothing to the amelioration of the human condition. He is entitled to honor, but the world owes him far less than it owes the inventor of printing, or of the telegraph, or of the steam engine, or any one of scores of other labor saving and civilizing inventions or discoveries.

I have thus hinted at some of the needs of Agriculture and

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Horticulture—more intelligence, more taste, more brain work, more leisure, more profit, more of those things which constitute the attractions and the glory of cities, less of those which constitute the repulsions and the shame of country life.

Now, as one means not yet mentioned, of the solution of this problem of promoting Agriculture and Horticultural interests; of giving to the country more of the culture, and taste, and comforts, attraction of city life; I would give to the city and the town more of the rural delights and the freedom and the health of the country.

This brings me to the second division of my subject, and that which more appropriately comes under the title, "Recreation in Horticulture."

I would recommend to business and professional men a systematic employment of a portion of their means and their leisure in horticultural pursuits. In this there would be the noblest recreation, refreshing both body and soul; and out of it might and would grow not only advantage to themselves, but benefit to horticulture as a science. Very many business and professional men dream of the delights of rural life, after they shall have acquired a competence to justify the luxury. They think the dream can only be realized at some indefinite future period. I shall proceed to show a better and more rational way than this. Let business and professional men more generally seek suburban residences, with two, three, ten or more acres of ground. Of this, let as liberal a portion as possible or convenient be sacredly devoted to the lawn and to ornamental trees. Let the truest principles of landscape and of architectural design govern the construction of both grounds and house. We are seeking the sources of recreation, of delight, mindful of the truth that a thing of beauty is a perpetual joy. There is no recreation more satisfying to a rightly cultured man, than association and communion with nature. He who finds not delight and renewed strength in the observation of her creations and processes in the external world, will not find pleasure in the creation of human artists. A painting or a statue will be devoid of interest to him. But to and of such persons—the exceptional Gradgrinds of our civilization—I am not talking.

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Here let me emphatically say, that the picture of suburban felicity which I am now drawing requires spacious and beautiful grounds as its chief feature—a necessary feature. A spacious and elegant house and costly furniture, are desirable, and shall go in, if the bank account shall permit, but they are not essential. There is in this country far too much building of houses for the admiration or envy of our neighbors. The more simple style often seen in England—a neat but inexpensive cottage or villa, in the midst of an elysium of lawn, and trees, and flowers, and graveled walks—commends itself to a truer taste, as well as to a more moderate purse.

One of the earliest recollections of my childhood is of such a place in the lake region of central New York. Ten or twenty acres of charming park land encircled the inexpensive but convenient house of one whose money might have built a regal palace. The place was not only the admiration and delight of neighbors, but an occasional English visitor felt there as if he were in the verdant glories of his own country.

I have in recent days been nowhere so fully impressed with the truth of the ideas I am now presenting, as when traveling, not long ago, on the carriage road from New York City to Tarrytown. The drive was a perpetual delight. Perhaps nowhere else in America are to be found in a similar distance so many tasteful and delightful homes. I found it difficult to say whether I admired most the regal residence encircled by forty or more acres of equally regal park land, or the more simple but tasteful cottages and villas embosomed in the trees and shubbery of half an acre, or even less. Along that famous river Horticulture has achieved some of its best American victories. Happy the business or professional men who, after the day's toil and bustle of the city, can find recreation in such charming homes! Happy the children who there live, and play, and grow, and learn, amid surroundings so salutary to body and mind!

If it be objected that this union of country and city life is expensive—a luxury only to be afforded by the rich—I emphaticly deny the necessity of it. I know that it often is, but I say that it need not be. Suburban life might easily, with the proper management, be made pecuniarily a self-sustaining pleasure. With from

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three to six acres of ground, near any city of half the size of Madiscn, it would not be difficult, from the sale of fruit, to pay the salary of a permanent gardener, and the interest on the cost of the land, and thus to have free of expense a permanent paradise of lawn and trees and fruit and healthful recreation. A pleasure thus self-sustaining would to most men be the more unalloyed. In what may be termed practical Horticulture, as opposed to ornamental, a cabbage head which the account book says has cost a dollar to grow cannot be contemplated by the producer with unmixed delight, nor will one's strawberries be quite satisfactory if inexorable figures make them twice or thrice as costly as those of the market. Notwithstanding the wide circulation and popularity of such books as "Ten Acres Enough," "Four Acres Enough," etc., there is an impression in the common mind that they contain more poetry than truth—that such pictures as they present are snares and delusions. This impression has probably been strengthened by Mr. Warner's delightful little book, "My Summer in a Garden," and other kindred writings, in which there is a vein of infidelity in respect to the pleasures and profits of gardening.

But it is with much confidence that I have made the statement above, respecting the comparatively easy possibilities of practical horticulture. A pleasant experience of five summers in a garden has convinced me that there can be profit as well as delight in amateur horticulture. And it has also convinced me that horticulture is worthy to rank with the higher professions. Great success in it requires cultivated and trained faculties exclusively devoted to the business.

While my own success has been small compared with the possibilities which I realize, and towards which I have been slowly advancing, yet that success has been encouraging. I have no time to enter into details, but will simply say that with an average of two acres under cultivation; with no home market worth the mention; with nearly everything sold in Janesville, eight miles distant, or in Milwaukee, sixty miles away; with good help willing to obey orders faithfully, and with orders well considered beforehand; but with several mistakes annually occurring from my want of previous knowledge; under these semi-favorable conditions I have only only once failed to realize above all expenses of

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cultivation and transportation an annual profit per acre about equal to the original cost of the land per acre—$100. In the meantime there has been growing upon part of the land a fine orchard of seventy five apple trees, now beginning to bear. I say nothing of the grapes, plums, strawberries, raspberries, currants, asparagus, and the other garden products, which my family enjoyed in profusion, in such excellence as markets never afford, and the money value of which would be considerable. I say nothing of the pleasure I personally experienced in watching the growth and changes of the several months, from the buds of spring to the sere and yellow leaf of autumn. As pleasure sells in this world, I would estimate the value of this to average about $10 a day for the season.

I say, in conclusion, ladies and gentlemen, that this business pays, and that there is too little of it. More intelligent use of the soil, more permanent and more beautiful homes, less roving about to *find* the better lot we can more easily *create*, more out door life and exercise, more English love of nature and English health, less American love of money and fashion and American frailty of body —these are what we need more of.

I think better things are already coming. The parks that adorn our great cities give proof of it. Two individuals occur to me as giving proof of it—the founder of Shaw's Garden in St. Louis, and Woodward of San Francisco. Two cities do these men honor, and their names are known over the entire country. They must be men worthy of national esteem, and their noble example will, I trust, find imitators in many another city.

Can I more fitly close these hurried sentences than by saying that Madison presents peculiarly rare attractions for the suburban resident? When wealth and taste shall have fringed her lakes with beautiful homes, even as they have lined the banks of the Hudson, then shall art have fitly set these now rough, but almost incomparable jewels of our capital.

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ANNUAL REPORT OF RECORDING SECRETARY

G. E. MORROW, MADISON.

The public work of the society for the past year consists of the annual meeting a year since, with its addresses and discussions; the annual exhibition at Milwaukee, in September, in connection with the exhibition by the State Agricultural Society; a meeting for discussion at that time; a small show of fruit at the American Pomological Society meeting at Boston, in September, and the publication of the annual volume of transactions, prepared by the former secretary, Mr. O. S. Willey.

THE ANNUAL EXHIBITION.

Notwithstanding the many unfavorable circumstances, the exhibition of horticultural products at Milwaukee was exceedingly creditable. In quantity there was some falling off in comparison with former years, and so possibly in the general average excellence. There were, however, exceedingly fine specimens shown in every class. As a report will be made by the Superintendent detailed statements will be inappropriate here.

MEETING FOR DISCUSSIONS.

In accordance with directions of the society and with my own decided convictions, a meeting was announced to be held in Milwaukee on one of the evenings during the exhibition. A rainstorm during much of the day, and continuing into the evening, much reduced the attendance, but those who were present heard a very interesting discussion on topics of much interest. That such meetings should be held and made a prominent feature of the "fair week" I have no shadow of doubt.

AMERICAN POMOLOGICAL SOCIETY.

The unfavorable fruit season in our state and other causes made it seem doubtful whether it would be best to send any fruit

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to the meeting of the American Pomological Society at Boston in September. It was, however, decided by a part of the committee appointed for the purpose, to send a small collection. No official report has reached me from that society. The public prints announced that to Messrs. G. P. Peffer and C. H. Greenman prizes had been awarded for collections of plums.

The next meeting of the American Pomological Society is to be held at Chicago in September, 1875. The horticulturists of Wisconsin should feel an especial interest in this meeting. It may not be advisable to take any official action concerning it at this time, but it will be well at least to keep the fact in mind and be prepared as individuals, and as a society, to do all that is practicable to make the meeting successful, and also to make it a means of giving to the country a more correct knowledge of the capabilities of Wisconsin as a fruit growing state.

A movement has been started, by the Kansas Horticultural Society I believe, looking to the establishment of a Western or Northwestern Horticultural Society. Former attempts of the kind have signally failed. It is unfortunate that this attempt is accompanied with statements concerning the American Pomological Society, leaving the impression that it is mainly an eastern institution. With the next meeting appointed in the west, the present and former secretary western men, each western state represented by vice presidents, etc., while the greater portion of the expense has been borne by eastern men, such comments seem especially ungracious. The society should receive our hearty support. If it seem best to establish a western society, let it be done because it can aid the American Society or do a separate work.

Hon. W. C. Flagg, of Moro, Ill., the secretary of the society, we expect to be with us, and we will doubtless hear from him concerning its plans.

HORTICULTURE AT THE CENTENNIAL EXPOSITION.

Arrangements are being made to have American horticulture appropriately represented at the Centennial Exposition at Philadelphia in 1876. This society will undoubtedly heartily co-operate with any efforts in this direction.

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THE ANNUAL TRANSACTIONS.

The last volume of Transactions was prepared for the press by the former secretary. It contains a very large amount of valuable matter. These yearly volumes are sometimes not prized as they should be. In a few years the earlier volumes will have become quite rare and be much more highly prized.

It should be remembered that by the law authorizing their publication the distribution of most of the edition rests with the state superintendent of public property. Among other provisions he is authorized to send 50 copies to any county or other local horticultural society sending a prescribed report for publication in the Transactions. I have received reports from a number of such societies, but it is important that all should be represented.

PROGRAMME FOR THE PRESENT MEETING.

In arranging the programme for the present meeting, while the great importance of discussion has been kept in view, it has been thought best, in order to give direction to the discussions and to secure carefully prepared thoughts on each topic, that brief papers be presented. An examination of the programme will show that an attempt has been made to have each of the great branches of horticulture, in the wider meaning of word, represented. Timber culture, orchard and small fruits, vegetables, flowers, ornamental planting, and home decoration are each given a place.

The list of names shows an array of "practical" and experienced men and women, non-professional as well as professional; those learned in the knowledge of the schools, and those whose knowledge has come mainly through their own experience and observation, but not one who has not had opportunities of learning concerning that of which he writes.

FUTURE WORK FOR THE SOCIETY.

The future usefulness of the society depends in a large measure on our success in making in include in its work and include in its work and interests all branches of horticulture and inducing the non-professional classes—farmers, residents of towns and cities and ladies as well as men—to interest themselves in it.

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In a new state, especially where there are some discouraging circumstances, the interest in horticulture develops slowly. To stimulate this development and interest the largest number in it should be one great work of the society. So long as there are homes in the country without orchards and gardens, trees, and and flowers, and homes in the towns without plants and flowers; so long as the fruit of the tree, the vine, the bush, and many of the products of the vegetable garden are almost unknown in many houses, this society has a work to do.

Through its regular channels it can do much. Closer co-operation with local horticultural societies in the state would help it to do more. By the efforts of its members in these societies and through the press it can do much.

"EFFECTS OF THE WINTER OF '72-'73."

No subject will occupy so much of our time at this meeting as this. Many have felt the effects in large loss of money; very many in sore disappointment and destruction of their long cherished hopes.

We have much to learn from the lessons the injury to our nurseries and orchards have set before us. We had forgotten the similar lessons of '56 '57; had grown careless and were planting what we ought not. Some of us were too sanguine. Now we need caution lest we go to the opposite extreme, growing discouraged and hopeless. We have recommended some varieties we ought not. Let us not by too sweeping condemnation reject varieties which are of great value.

THE FRUIT LISTS.

There are strong arguments against such a society recommending any varieties or sending out any lists. There are stronger arguments in such conditions as we have, in favor of so doing. The peculiar condition we are now in, make it especially important that great care should be taken in preparing the lists. It is important that there be a revision of the entire lists.

It should be understood by all that placing a variety on a list for general cultivation is not a guarantee that it will do well in all possible places. It is simply the expression of this society that

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this variety can be safely planted generally throughout the settled portions of the state—that it will do well in most localities. It is impossible to give specific directions as to the places where it probably will not do well. The list is a good starting point for the planter, to be modified by local experience or the local peculiarities.

If we adopt the rule that no variety which is known to have been killed or injured in 1872–3, is worthy of further culture, we sweep out the entire list—crabs, Siberians, long tried favorites and promising new varieties. The strictest scrutiny of the record of each variety should be had, and however we may have prized it, if it has failed, let it go. But killing in a few places or under exceptional circumstances should not condemn a variety which has generally withstood the test. Killing in the nursery rows or in a recently planted orchard does not necessarily prove lack of hardiness—comparative hardiness, for no variety is perfectly hardy. A tree of several years growth of a tender variety may have been uninjured while a young tree of a very hardy variety may have been killed. To reject the latter and plant the former would be unwise. It is right that the individual should be guided by his own experience if he do not learn that this is exceptional. By getting the experience of many, this society can determine what is exceptional.

NEW VARIETIES.

The past year has brought few new varieties into prominent notice. The society is doing well in offering premiums for valuable seedlings. We can expect with confidence that many valuable varieties can be produced in this way.

There is also a promising field, so far as apples are concerned, in neglected or unknown varieties in our older orchards. If it be found that in various parts of the state, trees of any variety have lived and thrived and borne good crops of good fruit for a score of years past, this fact makes this variety worth our notice.

PREMIUM LISTS.

The revision of the premium list should be a matter to which time and care should be given. Our list is good as it is, but doubtless it can be improved. The main encouragement should

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be given to securing the exhibition of the most desirable varieties rather than the largest number.

The selection of awarding committees is a scarcely less important duty.

EXCHANGE WITH OTHER SOCIETIES.

Our society has done little in the way of sending delegates to like societies in other states. We have been favored with the presence of a number of delegates at our meetings, and such visits are both pleasant and useful.

Minnesota having so nearly identical Horticultural interests with Wisconsin, I proposed an exchange of the Transactions of the Societies in the two States, and hope to have a supply for the Members of this Society.

MEMBERSHIP.

Our membership is steadily increasing, but is still small, less than it would be did the people of the State realize the value of the Annual Transactions, to which all members are entiled.

STATE AGRICULTURAL SOCIETY.

The State Agricultural Society has dealt liberally with us in the past, and will doubtless do so in the future.

We meet in this desirable room through the courtesy of that Society.

LEGISLATIVE AID.

The State Legislature has liberally provided for the publication and illustration of our Transactions. I think we need ask no additional aid from it.

Arrangements have been made by the Chicago and Northwestern and Milwaukee and St. Paul Railway for reduced fare to those attending this Meeting. Our thanks are due them. Three hotels in the city will entertain members at reduced rates.

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FLOWERS FOR COUNTRY HOMES.

BY MRS. D. HUNTLEY, APPLETON.

To those who love the beautiful in nature, no home, however costly, is quite complete without its bed of flowers upon the lawn, its vine covered porch, or charming window garden. So general has this love for flowers become, that every person of taste knows just how to admire a well kept garden, or be grateful for a bouquet, but many who understand this perfectly, have none of these loving, changing beauties to adorn their homes. They have many reasons why they have not, and none is truer or oftener given than want of time. Particularly is this true of the farmer's wife. So seldom are flowers seen in any quantity about a country home, that many think it a mystery that they ever find a place around the farm house.

Many times has one farmer's wife we know, been asked: "How do you find time on a farm to cultivate flowers?" The only answer was, "It must be found."

It is a truth that cannot be denied, we all find time, more or less of it, to devote to the things we love. Among the various duties of farm life we may have no time for elaborate gardens or many varieties, but a few we can have—in the window, by the door, or in the vegetable garden, if no where else. It is the flowers themselves, and not any special arrangement, that will give most pleasure. No where are they more charming than about the farmer's home, and, we might add, no where is it more difficult to take time from household duties for these beautiful adornings. But, with a love for them that will conquer all difficulties, time will be found, space may be had, and skill will come if the heart is in the work.

It is thought by many that annuals are too much trouble; that a good collection of shrubbery, with a fine assortment of hardy perennials, is the most desirable for a country garden. We have

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shared in this feeling to some extent, and have made some unsuccessful attempts to enlarge our lists. Sometimes a half dozen varieties of pinks have died in one winter. The old fashioned Canterbury bell occasionally will not come up in spring, and all the summer we sigh for the blue bells of our childhood. Potentilla, Perennial pea, Narcissus, Digitalis and many others would not survive the first winter. After repeated trials the graceful Pentstemon bloomed two years in our garden, but the cold winters of 1872 and 1873 wholly destroyed it. The beautiful roses, too, shared the same fate; whether covered standing, laid down and covered, or not covered at all, they were alike destroyed, and spring found us with only a few old Pinks, the hardy Phlox, Herbacious Spirea, Dicentra, Peonies, and the grand old Lilies. The Tulips, too, had slept under their winter covering and hastened to greet us with their gorgeous colors as if to make up for the other treasurers we had lost.

Besides the disappointment attending the culture of perennials, we have found it more trouble to keep them free from grass, and to remove decaying foliage and seed vessels, than to care for twice the number of annuals. Then much of the summer perennials will afford no flowers, while with a good selection of annuals we may have a succession from spring till autumn. With this experience, and no time for uncertainties, we have learned to prize the annuals more than all the other treasures of the garden. Laid carefully away with no anxiety for their welfare, the little seeds and precious bulbs are all the long winter waiting our pleasure. We can plan with certainty for their coming, for the frost king cannot rule in every closet and cellar.

The most satisfactory arrangement for a small collection of flowers about a country home, we have found to be a few of the hardy shrubs and evergreens, too well known to be mentioned here, with as many of the beautiful roses as can well be cared for. The old familiar kinds we do not like to do without, but these so often die in winter, we have come to regard the perpetuals as safest. If they are killed to the earth in winter, the new growth brings the fragrant blossoms, and we have roses till the autumn frosts. These should be set about the dwelling, leaving an unbroken lawn about the door. Dearly as we love the flowers, we

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cannot do without the fresh, bright grass—nature's own carpet—spread for weary feet and playful children.

After the shrubbery we would plant, first, a good variety of early and late tulips, not because we love them best, but because they are so showy, so gay and cheery, and make the garden so bright in the waiting spring time, so attractive to the passer by and will grow with so little care.

After these, the hardy perennials before mentioned will always be satisfactory. Next, dahlias will give more of character and eloquence to the garden than anything we know; their growth is so stately, their flowers so magnificent, they richly pay for all their care. For farms where there is ample room for wintering, this splendid old flower is admirably adapted. Gladiolus, too, are charming in their time, of easy culture and should always be found in every collection.

The arrangement of annuals may be such as taste will suggest or oftener as time will permit. Set in a little border just about the house, we have found a pleasing way. So near they will claim attention, when they might be forgotten if far out on the awn.

Those varieties that bloom earliest and longest, will give most pleasure. Among these, Pansies and Verbenas are best. Asters are indispensable in their place; but when waiting for them to bloom, Verbenas will give beauty and fragrance for many weeks, and the Pansies will look up from their lowly bed with almost human intelligence. The other standard annuals are of easy culture. A single bed of Phlox or Stocks or Balsams will make bright any garden; while the spicy odors of the Dianthus will add perfume to all. A few more delicate things should be grown to set off the others, and for cutting. The best for this purpose is Centranthus Gila and Phecelia. If time is limited new varieties should be added very slowly.

The trouble which many experience about the germination of seeds, may be done away with, by a little care given to a seed bed or hot bed. Many varieties can be grown in this manner easier than a few planted in the open garden. Some of the most showy varieties of house plants will grow very successfully in the open air. Geraniums will grow readily from seed and will bloom be

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fore the frost. These can be wintered in the cellar with little trouble, and will make excellent bedding plants the second season.

Climbing vines should adorn every farm house; but few things are more satisfactory. Some of the best of the green house climbers will grow readily in any garden. The farmer's wife may have something more than the old fashioned morning glory, though it is doubtful if she can have anything more beautiful than these glories of the morning. Last season we planted in the hot bed few seeds of *Cobœe Scandens.* They came up readily, grew rapidly and covered the window with luxuriant foliage, and at length gave us its lovely bells blue. The canary vine, too, is seldom seen in small collections. But few vines are more attractive than this, with its perfect little yellow birds perched about among its light green leaves. This and cobæa, planted near each other, give a charming contrast, both in foliage and flower.

Another very desirable cluster deserving more notice than it receives, is the Star Ipomœa. Its little clusters of scarlet blossoms are most attractive among its green leaves, and among cut flowers, The cypress vine, with its finely cut foliage and wax-like flowers is one of the prettiest of this class of plants, but extremely sensitive to cold. It should be grown in some sheltered spot or sunny window.

Much may be done in flower culture in boxes placed on the piazza, on brackets or by an attachment fastened to walls. These are very ornamental on the outside of small dwellings, between windows, or on either side the door way. In these may be grown many kinds or a single variety. Upright flowers are pretty, vines are always pleasing, and trailing plants are charming indeed.

But of all the pleasing ways for growing plants the hanging basket is most attractive. There is something about their graceful beauty that wins the love of all. Elaborate baskets may be purchased, or simple ones may be made at home that will be quite as pleasing. Some of the most beautiful ones we have ever seen were knots of wood from decayed forest trees. Many of these are of curious shape, much like ocean shells. With varish applied, and slender chains, or bright cords attached, they are ready for use. Others may be constructed of grape vines or branches of fruit and forest trees. In this way not only the flowers, but the

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receptacles in which they grow will become the admiration of all your city friends.

For basket plants the graceful Smilax is first of the list. Its dainty glossy leaves will add a charm to every thing it touches. Next the Erglish Ivy has the richest folage and if you can wait for its tardy growth you will have an elegant vine, but we like the German Ivy best. It will do such wonderful things in the way of adorning windows and pictures, and do them so quickly. The Kenilworth Ivy is the the best trailing plant we have ever grown, and unsurpassed for a center basket. Moneywort is also a good trailer, but is prettiest among other plants. All these are of easy culture, and if given much water morning and evening will delight you with their constant growth. If these are too many in a home where work must lead and pleasure follow, two or three varieties in a single baskest, or a little hanging garden, will become a thing of beauty, and give more pleasure than many a costly thing might do.

Any of these vines are exceedingly desirable for the lawn, on trellises or over rock work or in rustic vases or lawn baskets. These may be made of branches of trees interwoven with grape vines, bound with moss, then filled with earth, and are exceedingly appropriate for a country garden where all these materials are just at hand. In these may be grown several varieties. The Casena is very showy in the center of large vases or lawn baskets. Around this set Verbenas with here andthere a bright Pansy, and about the edge set trailing plants. If you wish vines for baskets with handles, Maurandya is excellent. One such basket will do more for its possessor if well cared for, than a whole garden of neglected flowers, and these are easily grown as the common kind.

Very attractive baskets may also be made of wire, lined with moss, filled with ferns, wild plantain and Lycopodium from the forest. These will grow all summer with very little care, in any shady corner of your rooms, and send up long, graceful, drooping fronds much larger than those first planted. In such a basket place a bunch of Pansies or Forget-me-nots, and you have one of the loveliest ornaments imaginable.

Many who grow flowers fail to derive from them the pleasure they might. They bloom in the garden where, often, the working

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woman may not see them the whole long day. To be prized, they should be gathered for our rooms, placed upon brackets and window-shelves, or made the center of attraction at the daily board. Never have we been more pleased with their exquisite beauty than when some thoughtful friend has surprised us with a fresh bouquet for the dinner table. It is wonderful to see how every member of the household will be touched by their gentle presence. All are made better by the little offering.

These silent teachers of the beautiful will win their way to every heart. The rude and the gentle, the old, the young, the good and the erring alike yield to their charms. With a changed expression and softened manner, the roughest laborer will take from the hand a simple flower with all the gentleness of a child.

"I do not know much about flowers, and do not care much about them," said one fine old gentleman, when passing through our garden, "but this," said he, touching the little pearl heart-shaped flowers of the Diacentra, "is about the prettiest thing I ever saw." We have seen the gray-haired man watch with loving care the cherished rose bush planted long years before by the young wife who early left him for the land of the fadeless flowers. The conquered Emperor in his rocky island home, could be quieted in his most fretful moods, with only a bunch of violets, such as bloomed in Corsican gardens where he played in childhood. It was the asters and pinks and pansies in a simple garden that touched the heart of the desperate Quantrell, and saved one home from destruction, when a peaceful western city was pillaged and burned.

The pleasures and benefits of the floral world are enough to commend its culture to all, but especially should they be brought to the farmer's family. To them they take the place of amusements, of society, of friends. They lighten the labors of life and ever make the home dearer where they grow. If trees and plants and flowers add so much of beauty to city homes, surely a country home, set down among all these, may become a bower of beauty, if we only accept the bountiful gifts of nature, gather them about us and make them companions of our daily cares.

It may be difficult to do this. There will be losses and failures and disappointment, still we will work on. Those who have gath-

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ered here to talk of the past, and plan for the future, will go back to their homes to do a better work than they have ever done, and while you of the city build elegant mansions with costly conservatories and elaborate gardens, we of the country will grow our splendid trees, will raise our choicest flowers and make our country homes dear as your own. Wisdom, excellence and beauty shall crown our labors, and in coming years, in other lands the story will be told, that Old England has no wiser sons than ours; France, no sweeter flowers; sunny Italy, no lovelier scenes; all the wide world, no happier homes.

THE ADORNMENT OF HOME.

BY MRS. H. M. LEWIS, MADISON.

A true home is a place of love, liberty and repose; a retreat where masks are removed and men and women are what they seem to be. There let the children learn to admire and love all that is beautiful; not to gratify pride, but as we admire pleasing objects for the eye to rest upon; as we admire nature. There teach them to extract all happiness and enjoyment from within and around themselves. Children should be taught to regard home as an earthly paradise, where everything possible is done for their improvement, advancement and enjoyment, and our land will be filled with better men and more noble women—our reform schools and prisons have fewer occupants.

By this I do not mean that license and liberty should have full sway. Nothing can be more pleasing than an orderly home, but a home without liberty is little better than a prison. Many homes are gilded palaces, too fine to be used and enjoyed. If the blinds are opened the carpet may fade; if the window is opened for fresh air a fly may appear. "Fine furniture, over-neatness and nerve put out the home fires of many a heart and hearth."

I have seen over-neat mothers lock their setting room doors

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upon their innocent, sickly children for fear the playthings might litter up the room, and oblige the children to endure the extreme cold out of doors in winter or remain with a cross servant girl in the kitchen, for hours together, and upon the mother's return she has found the children nervous and rebellious for the remainder of the day, and has found it impossible to govern them without recourse to the closet or whip. I have seen these children very happy and gay away from home, and have heard them say: "I wonder we never have as good times at home as other children do." The little ones feel a wrong as keenly as the older ones, but they feel their entire helplessness to do anything for themselves. "Many a distorted life has taken its bent from an uncherished childhood." Who is responsible?

Mothers that govern in such homes must close their eyes to the beauty of nature, and can seldom find time or inclination to take a walk with the children in the woods, or down to the cool waters edge, or for a ramble with a dear friend for a basket of ferns, mosses and wild flowers.

> "And along times thorny road,
> Faints the soul beneath the load."

This is all very wrong. God never intended us to spend this short life in such menial pursuits. Why did He make this world of His so beautiful, and why did He give us this capacity for the enjoyment of its beauty if He did not expect us to enjoy, and not abuse it. We cannot look upon the fragile flower, with its delicate tints, or the majestic trees that withstand storm and tempest, or the diamond glistenings of the dew, frost, or rain drop, without seeing the wonderful workmanship of the great Master's hand. Let us begin to catch this beauty and inspiration here, and in the dim far away future we shall reap eternal harvests of never ending joy and felicity.

How much better for the comfort of some of our overtasked, weary women who are wearing out soul and body in an effort to outdo a neighbor or friend, to go back to the good old New England times of big kitchens and fire places, where the great back log blazed, sparkled and sputtered, sending a circle of light, warmth and love over all.

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Our homestead had an ample hearth,
  Where at night we loved to meet;
There my mother's voice was always kind,
  And her smile was always sweet:
And there I've sat on my father's knee
  And watched his thoughtful brow,
With my childish hand in his raven hair—
  That hair is silver now!
But that broad hearth's light! O, that broad hearth's light,
  And my father's look, and my mother's smile,
They are in my heart to-night!

Those old-fashioned homes possessed a kind of charm which made it easy to live natural, social, happy, truthful, independent lives.

It is not necessary to spend a great amount of money to make a home cheerful, and even beautiful. I remember experiencing a great deal of pleasure some years ago, as I was out upon some soldier's aid mission work, to find, upon entering a poor widow's house, rare indications of fine taste; such taste as a queen might have coveted. The windows were partially shaded by climbing vines from the outside. The curtains were of plain muslin, very white and full. Pressed ferns and delicate autumn leaves seemed to hang in graceful festoons upon the curtains, and over the pictures (prints) were bright clusters of maple and sumack leaves. Sprays of scarlet woodbine (pressed) were arranged artistically upon the white wall back of home-made brackets.

The only expensive articles in the room were a fine steel engraving of Evangeline, and a Parian marble statuette of a beautiful cherub with wings. Evangeline was set in a rustic frame, with the rich dark green of a growing ivy nearly covering the frame. The pot or can containing the ivy was concealed back of the picture, and a part of the ivy fell naturally back of the child near the wall and made a lovely background. In one corner, rather low down, stood a shelf covered with some kind of scarlet drapery, and upon the shelf a fine shaped rose geranium had been placed—evidently just brought in from the garden, as its color was very fine. A number of shelves, containing books, seemed to look at me in a homelike way, as much as to say "I am not too fine to be read," and in the center of the room stood a

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medium sized center table, covered with a spotless white cloth. The only article upon the table was a large celery glass, filled with a choice collection of grasses; the high ones filled the center and the fine tremulous ones droped from the sides. The only blossoms it contained was a handful of scarlet nasturtiums. The glass was set into a large saucer, and that was filled with very green moss and delicate vines. The simple parlor was an enchanted one. I wish that I could have taken some of our ambitious, overtasked men and women of fashion, who are miserable over their thousands, into that humble cabin. They would have been astonished at the ease, rest, peace and comfort pervading that home.

A few well kept blooming plants add greatly to the happiness and adornment of home, and are a blessing. Nothing for home adornment can equal plants, because they possess life. We take a slip of a choice rose, put it into the earth; we water it; we cherish it; we give it sunshine and shade, and after a little time new leaves develop; and upon close examination we discover a tiny bud. Every day we watch its progress forward, until it bursts forth in beauty. Each member of the household admires its color, form and perfume—can we help loving it? People who send to the green houses for plants in bloom, and as soon as the blossoms fade return them to be replaced by a fresh blooming one, can form but little conception of the comfort and joy that we have received from this one, that we have cared for so tenderly all its life.

Some complain that they cannot make plants in their living room thrive. The leaves turn pale and yellow; if a bud appears it is sure to drop off. If we fail after giving suitable care to our plants, it is time that our furnace and gas fixtures were examined, as undoubtedly we are breathing but little pure oxygen. Our atmosphere is charged with the poisonous cabonic acid gas, which makes feeble children as well as feeble plants. If we have but one window in the living room, it should not be put to the exclusive use of plants, as light and sunshine are essential to the health and happiness of the family.

A couple of large English ivy's placed in different parts of the room, trained near the ceiling, over the windows, and around the pictures are charming, and will grow finely if the room is not too

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warm. I know of no plant that gives the comfort of the English ivy, if well cared for and watered freely.

Growing ferns, Lycopodiums, and wood mosses, arranged with geological specimens, corals or shells, into fire places or grates in summer, can be made very ornamental if well arranged. The ferns should be introduced when the fronds are just starting. The Wardian or fern cases are very desirable and beautiful if persons have not room for growing pot plants (and indeed they are beautiful in every place). They are not easily affected by changes in temperature, and will grow without sunshine, but a little sunshine improves them. One not too large, placed upon the marble slab in front of a large mirror, where its beauty can be reflected back, is very attractive.

Window gardens, or large ornamental boxes, lined with zinc, and placed upon a low carved or rustic table, the case filled with suitable soil, and stocked with a fine assortment of plants and vines, is a satisfactory and easy way of growing plants in bay or bow windows, and will probably soon come into general favor.

Many people use the double sash in the windows in winter. A collection of our native ferns, pressed and arranged with a few bright autumn leaves, the ends of the stems covered with wood moss, inserted between the sashes, will give the appearance of a growing fernery and will last a season. This is particulary desirable if the view from the window is unsightly . Autum leaves and pressed ferns are becoming almost a necessity in every home for Christmas decoration. We should aim at a happy medium in ornamenting our homes; too much of the ornamental is in bad taste.

The devices for making hanging baskets are nearly endless—wire baskets, large sea shells, square, shallow ornamented boxes, large and small wooden bowls, painted or ornamented with the roots of the grape, lichens, cones, bark, twigs, etc. Hanging baskets filled with delicate, graceful vines are always beautiful. Another beautiful and not expensive ornament for the outside of windows is square boxes a few inches shorter than the window sill, six or eight inches high, the outside covered with moss, the case filled with geraniums, roses, fuchsias, dark and light foliage plants, vines, etc. These hanging gardens (as they are called)

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can be bought at the seed stores in the large cities, made of tile, carved wood, willow, iron, etc. These are to be supported by iron brackets.

Nothing is so beautiful for the grounds about the home as a velvety turf closely trimmed; a fancy wire or rustic stand filled with choice plants; boxes and bowls filled with vines. Geraniums and foliage plants placed upon the stumps of trees, balconies, or door ways, are usually more pleasing than a heterogenous masses of flowers crowded together in beds, and require much less time to take care of them. A rustic seat under a large tree or in a bower of green; a graceful piece of statuary; the stump of old trees hollowed out and filled with ivy and geraniums, or a pretty rockery filled with vines, ferns and delicate flowers in a shady corner are very desirable, and one or more of these pretty ornaments can be added to any home without great expense or effort.

Specimen plants of the Agave or Century plant, Ficus Elastica or India rubber tree, Dracena, Palms, Chamerops and Yucca, grown in urns or fancy pots for the decoration of gardens or balconies are very effective, and those specified have thick, large ornamental leaves that remain years without change, and will endure the heat of our dry, hot summers well.

Let the honeysuckles, climbing roses, woodbine and morning glorys, come creeping everywhere; over the trees, balconies, fences outbuildings and summer houses, to cheer and brighten our lives. The birds will soon find these shady retreats, and warble forth their songs of praise to us for making them a home in which to raise their young.

There is a sacred love of home planted in every human heart; let us cherish that love, and when we are beautifying our homes let us remember that it is not for our enjoyment alone. The tired laborer, the student, the traveler, the poor seamstress, the sick and wanderer, who have neither time, room, or means for such refinements, may find here cheer, courage, comfort, and long after will cherish the memory of its beauty, and it may awaken noble thoughts, impulses and resolutions, that will last for all time.

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HOMESTEAD TREES.

BY ELLEN P. ALLERTON, LAKE MILLS.

Let us plant them in every corner. There is room enough. At the front of the house, at the back, at the side; let the branches clasp hands above every door, and fling a checkered network of shadow and sunbeam on the theshold. There should be no bleak, treeless side to any country house.

In our Northwestern climate, so prone to extremes of heat and cold, we have special need of trees. We need them to tangle the hot rays that come pouring down at midsummer, and to browbeat the winds that come charging across the prairies in winter. A frost blast loses half its keenness, if its edge is dulled against a row of trees; a furious, gusty storm of whirling snow half forgets its vengeance by the time it is sifted through the branches.

We need trees for shelter, but is that all? We want fruit trees of course for the fruit—but beyond these merely physical needs, is there not another? There is a mental and a moral necessity, which is too apt to be overlooked.

As a home, so are the inmates—a general rule, liable to exceptions, but a rule nevertheless. Given, a farm house of long standing, with bleak, bare walls, without even a vine, a dreadful emptiness of front yard, and not a tree within shooting distance, except a huddled clump that is called an orchard; you will at once feel, whether you say it or not, that everything there is done by square and line, and no nonsense about it. You will infer that the head of that establishment is a neat farmer, because there is no litter; a severely practical farmer, because he is careful not to do anything that don't pay, and as a companion, about as versatile and interesting as his gate post! His wife may not have been born that way, but she has probably grown into it. She has to be perpendicular, and so do the children. There is no graceful twining and festooning of human nature, in *that* family. A good deal to assume from a tidy but treeless yard, yet it is generally safe enough.

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As to the question whether mere shade trees pay, it is one which cannot be settled by figures. It is not a mathematical question. But it is a good thing to work out some problems outside of algebra and arithmetic, and this, happily, is beyond them. Will it make a family better and happier to raise trees? There you have it, fairly stated.

We have all been children, at some period more or less remote. Let us jog our memories a little. Many of us can look back to some old country house, with low roof, may be, and brown walls, but caressed and sheltered by noble trees. And how do we feel towards those venerable maples, and balm-of-gileads, and butternuts? They are every one of them old friends! Our hearts thrill with tenderness at the thought of them, for they had a part in our bringing up.

Under their shade we built our first play house, and dressed our first doll. We rolled our hoops round and round them, till we grew dizzy. We had our swing in the high branches, and the first flight took our breath away. Oh, the delicious terror of that swing!

Then the birds! It was there that we learned the difference between a bluebird and a robin, and wondered why the bobolink always lit on the topmost twig, and why his long ringing solo never seemed to put him out of breath. We studied natural history in those trees, with our parents to comment and explain. They had planted the trees for their children to play under, they said. They grew old—the dear father and mother; their heads were crowned with snow, winter and summer, like the tops of mountains that lie near heaven. Yet the trees were green. They left the country for the city—the silent city—and never came back; yet the trees they planted still grow higher and higher, and stretch their arms wider.

Shall *we* not leave such monuments behind us? Shall we not do for our children what they did for us? Let us not talk about the money value of homestead trees. There is a value which is too sacred to be mentioned in the same breath with dollars and cents. Anything that draws the heart of a child homeward; anything that causes it to turn back tenderly after years of absence;

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anything that will make affectionate memories after we are under the sod—it is worth our while as parents to do. For this, if for nothing else, it will pay to plant trees.

ORNAMENTAL PLANTING.

BY F. S. LAWRENCE, JANESVILLE, WIS.

The true mission of all horticultural societies should be to collect and disseminate correct information on all subjects pertaining to horticulture.

Closely alied with and forming a very important part in the art of horticulture, is that of Ornamental planting. It is one of the pleasurable features of the great whole—a creation where art assists nature in forming a picture the most pleasing and agreeable.

To successfully acomplish this requires taste and skill more than money, though the latter is a very valuable adjunct—I am free to confess—yet not wholly essential. Another very important requirement—perhaps the most essential of all—is *purpose*, without which little can be accomplished, and all efforts looking towards success may prove abortive and become failures. Purpose combined with taste and skill; these may be said to be the three necessary qualities by which we may hope to achieve success. The want of them will, most assuredly, lead to disappointment and disgust.

The term Ornamental planting is very comprehensive in its meaning, embracing not only the higher style of Art embodied in Landscape and Ornamental Gardening, as exhibited in the formation and laying out of public and private parks and grounds; but also treats of, and has to do with the more modest and unassuming treatment of the "rural home"—whether it be located upon the farm—or within the more circumscribed limits of some city or village plat. It is not our purpose at the present time to discuss the former—but shall try to give some hints and suggestions that

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may be beneficial and prove of value to all who may attempt to beautify and decorate their homes, and make them, at least, more attractive, if not more valuable.

It is proverbial that no class of persons are so negligent in this important matter as the farmers. This is almost unpardonable in them, who live where the means necessary to do it may be had with so little trouble and cost. How few places do we see in our travels that are in any way attractive, when nature has generally been very bountiful, if not lavish, in furnishing them with surroundings, that with a little assistance from their hands, would furnish them a home, the most beautiful the heart could desire.

I have now in my mind's eye numerous places called homes that are very repulsive in the appearance, that might have been made pleasant and agreeable with a little outlay of time, trouble, or money. But I am happy in the thought that these blemishes on the fair face of nature are becoming more rare. That there is a growing and increasing taste in this respect, is apparent all over the land; more so, perhaps, in the immediate vicinity of our cities and villages, than in the country, as exhibited in the laying out of grounds and decorating them with trees, shrubs, and flowers. It should be the mission of our societies to encourage and foster this taste in our people, and to do this successfully it should be their province to furnish the masses with all the practical information on this important subject at their command.

It is a mistaken idea, indulged in by many, that to make a home place beautiful requires a large expenditure of money; and it is still more a mistaken idea that to accomplish this successfully, a person must be acquainted with the rules and principles of landscape gardening in all the minutiæ of its details, or if they lack this knowledge themselves, they must, perforce, employ some person learned and skilled in the intricacies of the art, to do it for them. These ideas have no doubt deterred many from undertaking what they have long desired, a home beautiful in its surroundings and adornments. As I have said before, taste and purpose combined with study and observation will produce the desired result—often much more satisfactorily than a lavish expenditure of money. Contrast, if you please, the little, unassuming cottage, costing a few hundred dollars, at most, but sur-

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rounded with a judicious assortment and well arranged variety of trees, shrubs, climbing vines, and flowers, with the large, uncomely structure called a mansion, upon which its owner has expended thousands, lacking these pleasant and humanizing surroundings, and say which of the two is the more attractive and homelike.

One great drawback to success, and which should be strongly guarded against in ornamental planting, is in undertaking to do too much, or in other words, overdoing. We are apt to crowd too many varieties into too small a space, which ultimately becomes a crowded mass of tall trees and small shrubs, giving a very uninviting as well as unattractive appearance to our places, when our hopes and desires have been otherwise. This arises in a great measure from a want of forethought as to the future growth of the tree or shrub. This is more particularly so with the novice, who does not understand fully beforehand the effect to be produced by the tree he plants—whether its future is to be of large size or otherwise. Most of them when first planted are of small size—just taken from the nursery row perhaps—and having a very natural desire to have many varieties, not only of ornamental kinds, but fruit as well, leads him to commit this great error. This is the more apparent where the grounds are more limited in extent, in our cities and villages, than upon the broader fields of the farm. Yet in too many instancees can this defect be seen even there. Trees have been set out indiscriminately, without any regard to their size or their ultimate growth. An Austrian or Scotch pine, as also the Norway spruce, are objects of beauty when only three or four feet high, and are very attractive in their appearance and are eagerly sought for, for ornamental planting, but how often do we see from ten to twelve of them occupying the space that should be allotted to only two or three, forgetting that when these small shrubs attain their maturity, they large size, crowding and robbing each other of nourishment, and from being things of beauty, will languish and die, and become a blemish upon the picture sought to be created. The same difficulty and trouble arises from the indiscriminate setting out of maples, elms, and other deciduous trees, whether they be placed along the boundaries of our lots, along the borders of streets or highways or upon the lawn or within the dooryard. Most of

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these too at maturity, attain large size, and require room to perfect themselves in all the magnificence of their natural beauty and elegance.

The number and variety of trees to be planted should depend upon the extent of the grounds they are to occupy—the larger and more extensive the grounds, the more numerous and varied the trees—being careful to give each tree, or plant, ample room to perfect itself as nature intended. If the grounds are small and limited in extent, plant only small trees and shrubs, of which, fortunately we have a great vaiety at our command, but plant them very sparingly. The grounds had better be converted at once into grass plats or lawns, than to be crowded with a confused mass of trees, vines, and shrubs, that will cause us vexation of spirit the remainder of our days.

Another great error committed by many, is in attempting to accomplish in a day, that which it will require nature, perhaps years to perfect. It consists of the very natural desire and determination of having at once, what may be called a "finished" place, rather than await the slower processes of nature in developing it. To gratify this, large trees must be planted rather than small ones. While it may be desirable to plant large trees along our streets and highways, it is not commendable to do so upon the lawn or in the front yard. A small tree well planted and taken care of will in a very few years outstrip the larger ones in growth and beauty. It is never advisable to transplant large evergreens which usually receive such a check to their growth by the act of removal, that they soon become unsightly objects, and finally, after languishing for a time, die. I can recall numerous instances and that within a very short time too, where I have seen this attempt to "improve upon nature" carried out with results the most dire and disastrous, neither body, limb, or twig remaining to recompense the owner for his outlay of time, trouble and expense. I believe it to be a well settled principle, if not fact, in horticulture, that the smaller the tree to be transplanted, the surer and more likely it is to live and endure the act of removal. When this principle is well understood by those contemplating planting trees of any kind—whether deciduous or evergreen—we shall witness less failures and more successes.

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But time, more than inclination, admonishes me that I must draw this paper to a close. I have endeavored to offer some suggestions that I have witnessed in my own experience and observation; and point out some of the errors I have committed, in undertaking too much, and of *overdoing* what little I have attempted to do, and for which I am now enduring the penalty, and which I will have to strive to remedy in the future.

Notwithstanding these apparent difficulties which I have endeavored to point out in this article, I cannot close it without urging upon all the importance of planting trees, not only for utility, but for ornament. Do it, if you have no other place than in the streets or highways, along the borders of your grounds or lots, and my word for it, you will never regret the time, trouble or money spent in doing so, remembering that "He who plants a tree creates a life," and erects at the same time a monument to himself, equally as enduring as the marble column or the granite shaft, pointing heavenward to cherish and perpetuate his memory.

HORTICULTURE AT THE FAIRS.

BY GEORGE J. KELLOGG, JANESVILLE.

What would our fairs be without horticulture? Nothing but prose, and hardly all of that, for we have something besides poetry in the ups and downs of horticulture.

And what is horticulture? Nothing but the cultivation of a "garden." I think Adam was a horticulturist, and I think our friend of Green Bay is also; but I think Adam ate something beside vegetables and pears. At least Eve had an apple, and, if but one, she divided it with Adam. What the kind was is very "unsartin." I would like to get some of the cions. I think Adam's garden took in his whole orchard, which was much larger than Webster's idea of horticulture. Whether Webster is right or wrong, as we understand horticulture it applies to the extended orchard of whatever size.

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Horticulture at the fairs is the presentation of the products of the fruits, flowers, trees, shrubs, and garden vegetables, in an arrangement at once pleasing, attractive and instructive. This is an exceedingly difficult task without any knowledge of what is to be presented for exhibition. For, in an unfavorable season, there may not be half products enough to fill the tables; and yet, even the very scarcity of horticultural products may stimulate to such extra exertions as may require more table room than in a season of plenty. Look at our last exhibition; the first to occupy had an abundance of room, while those tardy in arranging were crowded to half the space desired!

If in our premium list we should require notice sent to our superintendent at least ten days previous to the opening of the fair of the amount of table room desired by each exhibiter, then would we have some knowledge of the amount coming. Let this requirement be prominent at the head of each class and not in the general regulations, where but few would read it.

Then let classification and arrangement be made, grouping the several classes as far as possible together, bringing competitors in either class on one side of the building or the center. As arranged hitherto it has been extremely difficult for judges to work or to arrive at just decisions. For instance two plates of fruit competing for the same premium in the remotest corners of the hall must be brought together before an award can be made.

Let all the smaller entries be arranged side by side, and let suitable arrangements be made, either by colored paper or otherwise, so that each collection shall be distinct, and that a list of varieties of each entry be left with each entry card when the fruit is arranged; and let there be sufficient police force to guard the tables when the owners are not present. To the credit of the State there is not as much pilfering or rough handling of fruit at our State as at our County Fairs—especially free from this was the last exhibition at the "Northern State Fair."

Let checks be provided by the society upon which the names of the fruit shall be printed as far as possible, and a uniform appearance thereby presented which shall be instructive to the public. Let checks also be printed for the flowers and plants that all

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shall read as they run, for few who visit our fairs take but a hasty look at each exhibition.

Let the tables be covered with clean white paper by the society, as did our friends at Oshkosh, and, in case of dusty weather, let ample arrangements be made to sprinkle the hall and surroundings every morning.

Let such a committee on Nomenclature be appointed as shall be present to assist at the opening and arrangement of fruits, and see that no great errors are permitted to appear in the articles on exhibition.

The award of premiums is attended with great labor if properly performed, and after the best efforts of committees, doubtless there are many exhibiters who think they have just reasons to complain. It is impossible under the present arrangements to accomplish the great ends of exhibitions. There must be more room, better classification, and less work for committees. Make subdivisions of the classes, if you make smaller committees. Three judges are competent, if usually sober, to decide nearly all questions.

If the condition of the society will warrant, let the premiums be increased, and take a wider range. Let sufficient inducements be given to bring out the growing developments of cranberry culture. Let all the fruit interests of the state center in one grand horticultural gathering.

If any body is making money growing fruit let the facts be known, and how they do it. Perhaps we shall never be a Massachusetts state horticultural society, paying annully $5,800 in premiums and holding twenty annual exhibitions, but we can raise more dollar's worth of fruit than all Massachusetts. One item of Wisconsin fruit alone (I do not now refer to *pears*) will exceed in value all the fruit of that state — I now refer to the Cranberry crop.

What we have accomplished, and what we know, ought to enter largely into our annual gatherings. We may think we know a good many things, but a mild winter or a hard winter may upset all our pretended views and theories. We did know a few things after the winter of 1856–7, and have been learning new things ever since, till now we hardly know any thing at all.

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Why is it that our lake shore counties still continue to produce R. I. Greenings, Spitzenburghs, Baldwins, and all the tender pears, while interior counties can hardly grow the best eleven varieties recommended by the society? I think there should be a special list of premiums offered to bring out the old tender varieties in a class by themselves if the trees are healthy and productive. Let there be special lists of varieties recommended for these varying sections, one for the lake shore, one for the interior, and one for the frigid zone, and let the lists be divided for profit, general and amateur culture.

Let these sectional lines be shown at our fairs by such arrangements as will bring each class of fruits in close proximity.

In all our deliberations let greater care than ever be taken in recommending any variety, except when that variety will succeed, or else put all our lists on trial.

I would especially recommend that some proposal be made to our northern state fair, whereby our state horticultural society may become identified with that commendable exhibition of fruits.

HINTS ON GARDENING AND FRUIT GROWING.

BY J. M. SMITH, GREEN BAY,
President Northern Wisconsin Agricultural Society.

How shall we be successful, and yet practical, in fruit and vegetable growing?

At the first glance it may seem that, to be really successful, one must of necessity be practical, but the successful man is by no means a practical one of necessity.

For instance: a friend of mine at the east was once telling me of an immense crop of potatoes he had raised the previous season. I knew him well; I knew his land, and also knew that when he moved upon it from New York city a few years previous to that time, it was exceedingly poor; no portion of it would

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have raised even a moderate crop, without fertilizing in some way. He gave me a detailed account of his planting and cultivation of the crop, harvesting, marketing, etc. This crop was worth in the market 50 cents per bushel. And yet, said he, "that crop, large as it was, did not cost me less than $2.00 per bushel." That man was successful, at least in one respect, for he purchased an old, worn out piece of land, never in its best days good, and in a few years he made it produce very large crops of almost all kinds, and yet I do not believe he ever raised a crop to the day of his death, that paid expenses. He was a man of large wealth, and wanted to raise large crops, and was not over anxious as to whether they paid or not. His means were such that it was not a matter of necessity with him, that they should pay. Hence, to to him it was a success.

We all know of the wonderful success of the greenhouse of Mitchell, of Milwaukee; you have all of you looked with astonishment as well as delight upon the products of that building. They show what may be done, and so far, they are a grand success. Practically it is probably no more successful than was the farm of my friend at the east.

And yet I have no word of complaint to make against this class of cultivators. On the contrary they are to be commended. They teach us some very important lessons. They show us what may be and can be done.

To *us* is left another lesson to learn and to teach to others, viz: that such things can be done, and can be made practical, or in other words can be done and at the same time be made to pay. Do not understand me as claiming that all the varied tropical fruits that are now grown in the greenhouse of Mr. Mitchell can be grown in our fields, but to show what varieties of fruits can be grown, show how they may be successfully and profitably grown, is our duty.

For let it be understood that to the great majority of fruit growers, any fruit to be successful must be profitable. Our very necessities will in a short time compel us to abandon any fruit, or variety of fruit that does not pay, or in other words that we do not know how to cultivate in such a manner as to make it pay.

In this connection there are many things to be considered. For

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instance, I do not think I have *any soil* that is well adapted to pear growing, and I have some upon which, if I should attempt to raise them, it is very likely the cost of the pears might come somewhere near the price that my friend Kellogg claims that other people's pears cost them—$5 each. But that land will produce immese crops of strawberries, and if I do my part well, will produce them annually, with almost as much certainty as the summer sun returns; while one of my neighbors, about one mile distant, but upon a very different soil and with a different location, finds pears a reasonably sure crop, as well as a very profitable one at five cents each, and that, too, upon ground where he could hardly afford to raise strawberries at 50 cents per quart.

Let me venture one remark with regard to pear growing. While I do not wish to speak for the portion of the state that friend Kellogg represents, I do not wish the idea utterly and totally discarded, at once and forever, that pears cannot be grown and successfully grown in the portion of it that I in part represent. Not that I believe them capable of growing anywhere and everywhere, any variety, and every variety. But I am firmly convinced that there are thousands of acres of land in Brown county where some of our hardy varieties of pears if put out and well cared for, would not only live and bear, but would be a source of profit to their owner, and that, too, at prices much less than we are in the habit of paying for them.

My success in raising strawberries is a case in point here. I do not speak of it to boast of it; but while I have been almost uniformly successfully in raising large crops of them, and often very large crops, I believe I speak within bounds when I say that not one bed in ten that is set in and about the city of Green Bay, ever bears one fourth of a fair crop, many of the beds none at all, and that in the face of what I believe to be a fact, that there are very few places in the United States where strawberries as well as some of the other small fruits do better than there.

Why, then, do so large a proportion of those who make the effort to have a bed of strawberries fail? Some of them fail from one cause, and some from another. A few years since, nearly every bed in the city was filled with staminate plants, and yet the owners were vexed and annoyed, because they had no berries.

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One of the oldest ladies and settlers in the city was told that if she would get one of John M. Smith's boys to fit up her bed in the spring, a crop would be a sure thing. She sent for one of them and he went and looked at the bed, but told them it was useless to do anything with it, as it was an old bed and in addition to that the plants were nearly all staminates. The old lady insisted upon having it fitted up, as she said they had been good plants and only wanted fixing by some one who knew how.

My son cleared out the weeds and did what was necessary to give her bed a good growth; but told her, when he had finished, that she would not get berries enough to pay him for his work upon it. The result was as he told her. The following spring I was sent for, to come and show them how to fit up their strawberry bed. I told them their bed was utterly worthless, and if they ever expected to raise any berries they must set a new one. If they would get some good plants, I would show them how to make a bed, and how to set out the plants; but I would not touch the old one, nor give any advice about it, except to turn it under and plant the ground with something else. And yet in spite of all, they stuck to the old bed, and for aught I know it remains there to-day.

And yet that old lady complains that she cannot succeed in getting good crops of berries, although she keeps a gardener and has really a fine soil for large crops.

Now this is only one of many cases of combined ignorance and obstinacy we meet with in all directions, and that are the causes of almost countless failures; but the blame is all laid upon the poor soil, or bad climate, or their bad luck generally.

Another cause of failure is the following: A tree peddler comes along with a book filled with colored plates of apples, pears, plums, cherries, strawberries, raspberries, currants, grapes, and in short the whole list of fruits, real and imaginary, each one of such size and beauty as may possibly have been seen upon the grounds of some professional grower at some time when a combination of favorable circumstances produced some specimens of fruit of remarkable size and beauty. But not one chance in a million that the ordinary farmer will ever produce such a specimen. And yet the farmer is led to believe in the most wonderful and incredible

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stories as regards the productiveness and the value of the different kinds and varieties of fruit, vines and bushes, and at the time set, he pays his money and in return gets a lot of trash that is not worth one cent per wagon load.

For instance, a few years since a neighbor of mine was setting out some apple trees. I was passing by and stopped to see them. I asked him whom he bought from. He did not know, but a man from York state. "What are the varieties?" He did not know, but the man said they were the best varieties. "How much did you pay?" He replied, one dollar each, as they were extra large. They were large, sure enough; but they were utterly and totally worthless, even if they had been of some standard varieties. He has never had a single apple from them, and I do not believe he ever will get the first one from one of them.

This is one of very many cases that happen every year in my portion of the state, and I am sure that I am entirely within the limits of truth when I say that tens of thousands of dollars have been worse than thrown away in northeastern Wisconsin the last twenty years in just this way. It is worse than thrown away, for this reason:

The farmer supposes he is getting something that will in the future be valuable to him. But if they, unfortunately for him, live through the first year, he continues to devote time to their care for some years, to find at last that his trees or vines, or whatever they are, are of some varieties that are utterly worthless, or at least so there.

I do not wish to include nurserymen in this list of tree peddlers. And perhaps there are some honest and intelligent men among the tree jockeys, but I think sometimes if they were required to furnish as many righteous men as was required of Sodom, they would be obliged to submit to Sodom's fate.

Some twelve to fifteen years since, one of them who, for some years, succeeded in selling literally car loads of trees, and as I believe generally, if not always, got his trees at the east, used to tell his customers, and made a strong point of it, that no western grown trees would ever live to bear fruit. I asked him once where he got his trees; his reply was, "wherever I can get them the cheapest." That man sold, I think, more trees about there

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than any man has ever sold at the same time, either before or since. But I do not believe that one tree in a hundred that he sold, is to-day a thrifty or bearing tree. The same rule holds good in regard to the small fruits and vegetables.

Not a single year passes by but I am flooded with circulars, telling me of the wonderful qualities of this or that, and by the time that I wish to select my seeds for the season, I am often at a loss as to what to select. If any new thing comes out that is really valuable in my line, I need it, and am willing to pay for it. But if I believe these circulars and advertisements, I should fill my garden with a lot of trash that would bankrupt me in a short time.

And now comes the question, must this state of things continue? Is there no remedy? Fifteen or twenty years since, perhaps there was no adequate remedy; but it does seem to me that the time has come when the true and honorable men of our own state, might and ought to control this entire business. We have honest, honorable and intelligent men in the nursery business in this state, and they have stocks, and are capable of raising more of them to supply the demand, and it seems to me that they should combine together and in the first place agree to recommend only such trees and fruits as are known to be hardy, and are capable of enduring our winters.

And we know now what will stand our soil and climate much better than we did one year since. You can make up a reliable list of trees and fruits to-day that will be much safer than the one you would have made one year since. It is true that it will not be as large as the one you would have made one year since, but it will be all the more reliable.

It may hurt our pride a little, but let us make such a list that we can say to every farmer who wishes to purchase, that if he will set those trees upon a fair soil for fruit trees, and give them fair cultivation, he may rely upon a crop of fruit in due time.

If it is necessary to reduce our list of apple trees to half a dozen, let us do it, but let it be reliable. If we must reduce the list of pears to one or two, let it be so, and so with the small fruits.

For a number of years past, I have stubbornly refused to recommend more than one variety of strawberries except in this

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way: I have had hundreds of applications for advice as to what kind were the best to set for family use. I invariably tell them that, if they wish to be sure of a crop of berries, if they will set Wilson's Albany and give them a reasonably fair chance, a crop is almost a certainty. If they wish to experiment they can do so, and can try 50 varieties if they choose, all of which are recommended in different places and they may possibly succeed with some of them, but the probabilities are that they will never get paid for their trouble except from the Wilson.

I do not by any means believe that we have no other strawberry than the Wilson, or that under some circumstances other varieties may not be profitably grown; but if we recommend something to the average farmer, that with average care and cultivation, will do reasonably well, we may recommend him to try other varieties very lightly at first, and then if he succeeds, he is in a condition to take the full advantage of his situation, and eventually reap an abundant success both as regards his crop and his pocket. But if he has spent largely for some worthless trash, or worthless trees and vines even if they are of good and standard varieties, he has become disgusted and disheartened with the result, and does not care to try again.

This is a matter of vast importance to the people of our state, and whether it is to be continued in a careless, haphazzard sort of way hereafter, or not, is for you to say. It is true, you cannot dictate to men as to what they shall or shall not purchase, but it is also true that if you can, by your good sense and good care in introducing reliable fruits, introduce only such as are reliable, you will in a short time obtain the confidence of the farmers, and they will have no disposition to trust themselves in the hands of jockeys and knaves.

It has occurred to me that this is a peculiarly favorable time to make a list that can be trusted as safe. Suppose, for instance, in looking over our lists, we select such as have endured the successive droughts of '71 and '72, and then the terrible winter of '72 and '73. All such as have endured this trial may safely be set down as "iron-clad."

There are many others that may have passed through this ordeal in safety in some portions of the state, and perhaps in some

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favorable locations in other portions of it, and yet are not safe to recommend for general cultivation. This is a point requiring much care and a nice discrimination.

For instance we are in the habit of recommending the Concord grape as the best grape for general cultivation, and taking the whole country into consideration we are probably correct. But are we sure that it is the best grape all things considered, for our own State? In the Northeastern portion of the State, grape growing, like many other things, is yet in its infancy, but the results as far as we have gone, have surprised both friends and strangers, and that too in the most agreeable manner.

At the exhibitions at the Northern Wisconsin Fair, samples of remarkable size and beauty have been exhibited every year, of some of our more choice varieties, and the best growers in that portion of the State would, I think, hesitate long before they set the Concord at the head of the list for the Fox River Valley.

One of the oldest growers in Brown county has repeatedly told me that he could raise more pounds of Delawares from a given piece of land than he could of Concords, that he considered them almost a sure crop, having failed but once in ten years or since they first came into bearing. It is my impression that the Delaware is the safest grape that can be cultivated in the lower Fox River Valley, and more than that, that no crop can be cultivated with a greater certainty of success than can this delicious grape.

Now, suppose that this opinion is correct. It by no means follows that it would be the safest or best grape to cultivate in some other portions of the state, or that it would succeed the best, even in the western part of the state in the same latitude as Green Bay. Hence the necessity of a thorough knowledge of the various portions of the state, and the varieties of fruit best adapted to those different localities.

I have kept our fruit trees more particularly in view in these remarks because I deem mistakes in them of much more importance than in the small fruits and vegetables. If a man pays out his money for trees for an orchard, and after years of care and labor, finds that he has been imposed upon by either an ignoramus or a knave, or perhaps both, that his trees are worthless, not only his money and his labor are gone, but those years are gone,

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and he cannot get them back, but must begin again with only his experience for his pay. Upon the other hand, if a man humbugs me with some worthless thing in the shape of small fruits or vegetables, and I will own that they do succeed in doing it to a greater or less extent nearly every year, I soon discover the mistake, and no serious damage is done, as is the case where the orchard is a failure.

While insisting upon it as being the very best policy to recommend nothing until it has been thoroughly tried, I do not wish to be understood as not being in favor of progress, or that we shall have no more varieties, or no valuable ones, except those we now have. I believe nothing of the kind. Very many of the mistakes that have been made in fruit culture in this state have been almost natural results.

For instance a man comes here from Central New York State. It is not only sensible but natural that he should bring such fruits and vegetables for cultivation here, as did well in nearly the same latitude there. But after years of time and labor, he finds that rule is very far from holding good in all cases, and at last the fact stares him in the face, that in very many cases he must lay aside some of the varieties that he valued most highly, and substitute others in their places.

This one fact it took years to learn, and then it took years more to learn what should be substituted in the place of those cherished varieties, which stubbornly and absolutely refused to grow and prosper here. We have learned the first lesson tolerably well, not perfectly. The last one we have learned very imperfectly, but still we are improving, and every new and successful variety is still another advance in one of life's lessons.

And as year after year you find one variety after another of the different kinds of fruit that will thrive and flourish in our soil and clime, add them to the list, as I firmly believe that you will do, until we have a full assortment of fruits for the year, and one that will compare favorably with that of any of our sister states at the east.

I have not the time to follow this subject further, neither do I think it necessary. Allow me to say, in conclusion, that your

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work is a grand and a noble one. To a great extent, it is a work for the future, and only the future can decide whether you from this time forward shall do it well or otherwise. If you adopt a kind of half way policy it may and probably will result in putting more money into your pockets for the time being, and for a few years to come, but in the end will be ruin, and of such a character that only the work of another generation can repair it.

If upon the other hand you are governed by a wise and intelligent care for the future, and with an honest and intelligent conviction that you are doing the very best you know, for the best interest of your friends and customers, even though you may be sacrificing your own temporary interest for the time being, then indeed, are you doing your work nobly and well; and although you may not, and most of you probably will not live to see the full benefit of your labors, still there are other voices that will rise up and bless your memories, even though your hands and mine have long since ceased to labor, and our tongues lie silent in the grave.

PLANTING AND CULTIVATING AN ORCHARD.

L. WOODARD, MARENGO, ILLS.

Having been invited, through your secretary, to present an essay on the above subject, I will try to give some of the main points in growing an orchard, in which I have had several years experience in McHenry county, Illinois, adjoining your own state.

For an apple orchard select your location on a northern or eastern slope, I would prefer a gravelly loam or limestone soil. Plow your ground ten to twelve inches deep; would prefer timothy sod well broken and subsoiled. Set the trees 20 to 25 feet apart each way. If on Timothy sod as above, dig the hole about 20 inches deep and put the sods in the bottom, also have the hole large enough to receive the roots as they naturally grew in the row, and set the tree one to two inches deeper than it grew in the nursery.

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The mutilated portion of the roots must be cut off with a sharp knife, so as to leave the ends smooth and sound. From these ends new fibrous roots usually start. Wet the roots and then use the hand in working in the fine earth around them. Be careful to place all fibrous roots in their natural positions. Fill up, pressing down with the foot. Then mulch with coarse manure and while the orchard is young plow the furrows towards the trees, until you raise a ridge six inches to one foot high, to protect the roots from freezing during our severe winters. Plant the orchard to some "hoed crop," and cultivate from early spring to middle of July only, as cultivation after that time produces too late a growth, leaving the tree in an unripe condition at the setting in of winter. On prairie or level ground, plow towards the trees as above, until you have a ditch or "dead furrow" eighteen inches deep between the rows, to insure good drainage and protect the trees from "wet feet," and also to prevent them from starting too early in the spring.

PRUNING.—In order to grow fruit and have it well developed, it is necessary to have light and air. Therefore I would advise trimming annually, cutting away the unnecessary branches, so as to leave the tree in good shape with a well formed head, which should be from three to four feet above the ground. There are some varieties that need but little trimming, while others need more in consequence of their compact habit of growth. Where pruning has been neglected and limbs allowed to get large, the trimming should be done in November or early part of December, and the wound covered over with paint some time during the winter, to prevent leaking its sap in the spring.

Be careful to select the most hardy and profitable varieties, procuring your trees of reliable nurserymen and practical growers.

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HOW TO GROW AN APPLE ORCHARD.

BY E. H. BENTON, LE ROY.

1. *Selection of a Site.*—With most farmers this is governed more by nearness to house, for readiness of access, and protection from predatory bipeds commonly called "boys," than from the more vital consideration of the health, longevity and fruitfulness of the trees. We do not think it so essential that the site should have a slope towards a certain point of the compass as that it should be well drained, both surface and subsoil, either by nature or art. The very best place, (we judge from observation), is a limestone or cobble stone ridge or knoll. Where none of these natural advantages exist, it is recommended to plow into ridges, keeping the dead furrows open, being careful that they communicate with an open ditch or some means of ready discharge if the land is not sufficiently rolling.

2. *Distance Apart of Rows.*—Two rods, for general purposes, is a good distance, as most persons desire to raise some crop among their trees while they are growing.

3. *Age of Trees.*—Two and three year old trees, if they have made a good average growth, are better than younger or older ones for the average farmer, and yet most buyers choose the largest trees, thinking they get more worth of trees for their money; and yet experience proves that roots are more essential than top, to grow a healthy tree.

4. *Varieties.*—It is useless to recommend to most persons. They will get such as they have been acquainted with or such as are named by the agent who sells to them, but if any wish the benefits of our experience, we would advise in this latitude, for summer—Tetofski, Red Astrachan, Sops of Wine, Early Harvest and Golden Sweet. Fall—Pryor's Fall Stripe, Duchess of Oldenburg, Autumn Strawberry, Fall Wine, Fameuse, Plumb's Cider, Sweet Russet. Winter—Westfield Seek-no-further, Walbridge, Yellow Bellflower, Wagoner, Tallman Sweet. Late Winter—Rawle's

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Janet, American Golden Russet, English Russet, Winter Pearmain, Large Red Romanite.

5. *Setting.*—A cloudy, damp day is the best, but if that does not happen when you are ready, cut off every fracture of the roots with a sharp knife, stir clay in water till about the consistency of cream and dip the roots into it before taking to the field. Dig the hole larger than the roots need, unless the ground is newly plowed. Put only fine soil around the roots. Before the hole is quite full pour on water to settle the earth, then finish filling without any treading or packing. If water is not used, some mode of compacting the earth moderately must be used and it must be piled some above the surrounding surface to hold the tree from working at the roots—this must not be permitted as it will ruin any tree. We would set every tree with a decided lean towards the southwest, and head every limb to within three or four buds of its base. Mulching with old straw, coarse manure or any material which will keep the soil moist three or four feet from the body of the tree, is very essential to success. The best time to set the trees is just as soon as the soil is sufficiently dry to pulverize readily in the spring. Fall setting is advisable to those only who are conversant with all the physological laws of vegetable growth.

6. *After Treatment.*—Never sow any small grains in a young orchard unless you are sure none will grow within a circle of 6 or 8 feet about each tree. Better raise beans, potatoes or corn, until the trees come into bearing, but never fail to throw sufficient earth around each tree to make a mound a foot high and three feet broad, the last of November, to be removed when the buds begin to burst in spring. An orchard can be raised in grass land (clover is least likely to do any material damage), if the whole surface is well manured each year, but it is recommended to break it up and raise some hoed crop as often as once in three or four years. The natural effects of seeding down an orchard is to check growth and induce fruitfulness, but the fruit is not as likely to be as large or as good flavored. The danger incident to cultivating an orchard is, to produce too much and too late growth, thereby rendering the trees liable to fire blight and winter killing, both of tops and roots.

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7. No amount of foresight or precaution can entirely overcome the climatic difficulties incident to fruit growing in large areas of our western states. Certain localities contiguous to bodies of water and timber will scarcely feel these untoward influences but to most of us it will be more or less a precarious business even with the hardiest varieties known. The writer had healthy, vigorous trees, on a good location, of the hardiest varieties, killed indiscriminately the winter of 1872–3, and root killed at that, and from extensive observation the past summer, he is certain that had his trees been protected by mulching or a mound of earth, they would have all lived. Trees of the same variety, age, and only sixteen feet from them, in clover sod, were none of them killed, but their growth had not averaged over one-half of those that were cultivated.

Pruning should be done to prevent one-sidedness or any other malformation, such as limbs crossing or rubbing each other, and to remove all diseased or dead wood, and prevent, if possible, such forks as will hold water or split down. Time for pruning—from the first setting of the tree; better when just a bud—but any time when you have a knife with you, rather than not to have it done at all. It is worthy of remembrance that care should be exercised to keep the top of the tree the fullest on the southwest side. The lower a tree is allowed to limb, the earlier will it fruit, and the less liable will it be to the attack of grubs, to being blown down, and to working at the roots; and the easier can the fruit be gathered, and the less will be blown off by high winds.

This brief article is written not to discuss the many questions which arise as to the best varieties for certain uses, different modes of grafting, etc., but to serve as a safe guide to the person who desires to have fruit and yet cannot or will not read all that may be written on this many-sided subject.

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APPLE CULTURE—THE SITUATION REVIEWED.

BY A. L. HATCH, ITHACA.

THE RECOMMENDATION CONSIDERED.

The publications of the Wisconsin State Horticultural Society have an influence upon fruit culture among citizens of this state that no other publications can have. Emanating, as they do, from leading fruit-growers, prominent nurserymen and shrewd business men, they are presumed to present the conclusions derived from careful study, sound philosophy, extended observations and actual experience. Its recommendations are supposed to be safe guides to follow, and they should be practical, and when followed, sure to bring success. The novice in fruit culture turns to its recommendations with confidence. If he follows the recommendations, and does not succeed, he has just reason to complain. If farmers and general cultivators of the soil fail to grow fruit when adopting the same procedure, the advice of the society is then open to criticism.

The society has deliberately recommended year after year a "list of five varieties (of apples) for general cultivation, the essential requisite of which shall be hardiness, and to which there shall be no dissenting voice." This list is the Red Astrachan, Duchess of Oldenburg, Fameuse, Talman Sweet and Golden Russet. Now if the general cultivator wishes to plant an orchard, and will plant of these sorts, ought he not to expect success? If he cannot grow these, may he not well give up in despair? Failures and disappointments with these varieties among us common folk, are altogether too common for the credit of the state, throughout sections not always represented in the horticultural society, and localities whose needs the society does not understand, or if it understands yet ignores.

The object of this paper is to show our difficulties and to demonstrate the inadequateness of the society's recommendations to our wants and circumstances.

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OUR DILEMMA.

This section of Wisconsin is broken hill and valley land, more or less timbered. Along the main valleys the bluffs are from two hundred to five hundred feet high, extending back to the dividing ridges, and there reaching an altitude of five to seven hundred feet. Between these main ridges lie larger valleys, from one half to a mile or more in width. Between the lower bluffs and spurs lie the narrow valleys, from one-eighth to half a mile wide. The soil of these valleys is considerably impregnated with iron, but almost destitute of limestone. The lower parts are marsh, covered with wild grass, willows and alders. The subsoil, of tenacious, blue, black or reddish clay, cold and wet. The higher parts are sandy, yellowish clay, light loam, vegetable mold, etc., or may be very rich black mold, strong loam, or sand-gravel on side hills, as the case may be.

Two thirds of the farms here, now improved, are within these valleys, and it is certain that whatever is of "general cultivation" will be grown on these farms. If these valley farmers grow fruit, they must grow it near their homes, and consequently in these valleys.

Now, if the five varieties of apples, recommended by the horticultural society, fail here, what shall we do? With the exception of the Duchess of Oldenburg they have failed, and that is "our dilemma." In the broader valleys, where fogs prevent injury from untimely frosts, success has been more general; but in the narrow valleys throughout all this region, there is scarcely a farm but has been, at some time, stocked with more or less of these varieties and most of them have been slaughtered by our merciless climate. We do not think there was a bushel of Red Astrachan, Talman Sweet, Fameuse or Golden Russet grown in this county last year on trees in these narrow valleys. The trees have winter-killed or have been so badly hurt as to be almost valueless, not only last winter, which was exceptionally severe, but previous winters.

Gentlemen having high lands, open prairie or good fruit soils near bodies of water, or in large valleys, comparatively free from frosts, may grow these varieties to perfection, but they may not

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therefore, assume that all may grow them or that they are worthy of "general cultivation" where it is desirable to grow an apple at all.

Transcendent and other varieties of crab apples are coming into general cultivation on these farms and prove hardy, productive and reliable where the common apples fail totally, and where the Duchess of Oldenburg does not always escape "Scott free" from the effects of severe cold. They come into bearing at five or six years of age and, as is well known every where, are much more thrifty than common apple trees. In early fruiting they surpass common apples, for on favorable sites we can not expect Fameuse, Golden Russet, or Talman Sweet to come into full fruit until eight or ten yearsof age. It is true the apples are small as compared with Northern Spy or Alexander but many of them can be used without paring, the skin being thin and dissolving in cooking and are therefore as easily prepared for use as almost any fruit, and as compared with peaches, an almost universally acceptable fruit; they are not small. New varieties like the Sylvan Sweet, are being introduced of improved size and quality, that variety being from two to two and a half inches in diameter, and in flavor destitute of that peculiar lingering meanness that characterizes the smaller sorts. But the horticultural society has never recommended these "for general cultivation," and to us it appears plain they do not understand our circumstances.

A FEW QUERIES.

Now suppose a man has a farm on which Fameuse, Golden Russet, etc., have failed; shall he give up because he can't grow them? Would you recommend him to set more of them? Or should he set an orchard of the best varieties of crabs he can get? Again, suppose a farmer has no orchard, but is ready to set one, and has a site where he can grow Fameuse, etc., would you, therefore, recommend him to set only common apples and wait five to seven years for fruit? Or would you not advise him to set some crabs so he could supply himself with fruit in two or three years, and thus have fruit during two to four years that he must otherwise be without?

Again, suppose a gentleman has an orchard bearing good com-

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mon apples, can he not add some good varieties of crabs for variety and for reliability of bearing when the others fail a crop as they often do? Improved varieties of crab apples, like the Transcendent, are not mere substitutes for apples, but "form a pleasing addition to the variety of American fruits. They possess culinary uses not inferior to the best classes of fruit." Many sorts do not keep well, but neither do strawberries, raspberries or even peaches, yet thousands are pleased to have them. There are new varieties that do keep well and others no doubt will be introduced. Again we ask, if a man has no fruit and can not grow Fameuse or Golden Russet, what shall he do? The Transcendent is hardy; he can grow them; they are coming into almost "general cultivation" would you recommend him to plant some or not? We would and plenty of them too, so he could have them by the cart load and make the most of them, and we believe the Wisconsin State Horticultural Society would do the state good service in recommending them and at the same time promote the "Science of Pomology and the Art of Horticulture."

APPLE CULTURE IN NORTHERN WISCONSIN.

BY JUDGE G. W. CATE, AMHERST, IN WESTERN FARMER.

During the leisure days of winter farmers are thinking of the propriety of planting trees in the coming spring, and of course the question of varieties and management comes up for consideration. Last winter was a severe one, and all doubtful or half h ardy inds "bit the dust," and a tree that went through unscathed may safely be regarded as hardy anywhere.

My farm is near the junction of the Wis. Central and G. B. and M. Railroads, 75 miles west of Green Bay; the ground high and rolling, and the place occupied by the orchard trees fully exposed. A thousand trees or more have at different times occupied that piece of land, to thrive for a few years of mild weather, only to be cleared off by the first extra cold winter. Generally of

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such hardy sorts as nurserymen desire to sell, in all more than a hundred different kinds, but as each successive planting was swept away, a few more hardy than the rest would remain. In that way twelve years passed in the effort to obtain an orchard that would stand the severity of the climate, so that I am able to determine to my own satisfaction what kinds will stand the winters on my grounds, and I will mention them for the benefit of those who may have struggled as hard, but not as successfully as I have, for, notwithstanding I have failed in fully accomplishing all I aspired to, I have accomplished a good deal, and feel that the fruit I have raised, and the success I have attained have paid me for all the money and labor expended. A good deal must of course be credited to the satisfaction in having proven what are the proper kinds to plant.

First on the list is Sops of Wine, four or five trees in bearing five years, always a fair crop of the most beautiful fruit, and not a blemish on the trees. Three trees of Early Pennock in bearing six years, sound as a nut. Four trees Sweet Pear in bearing five years, perfectly hardy. Duchess in large numbers, always full of fruit as fine as ever was seen. Bearing trees of Golden Russet, twelve years planted, were uninjured last winter. It is sad to be obliged to stop here, but the truth must be told. As fine a lot of Fameuse, Tallman, Ben Davis, Golden Russet, three years planted, as ever were seen, were nearly ruined last winter, and I shall plant no more of them. Smith's Cider, St. Lawrence, Willow Twig, two years planted, shared the same fate, and no more of these will be set.

It will be observed that my list of hardy kinds are all summer or fall varieties. Now what shall I use for winter? Is there any that compares at all with Sops of Wine and Duchess in hardiness? The Pewaukee, said to be a seedling of the last named, had been industriously heralded as the coming winter apple for the northwest up to last spring, since which time but little has been heard about it. It probably succumbed to 30 degrees below zero. Last spring I visited a neighbor's grounds. He showed me two dozen Pewaukee trees obtained, as he said, of Mr. Peffer, and although the grounds were protected as effectually as any grounds could be, by adjacent timber and high lands, and the trees had been set

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out between nursery rows of young trees, affording, I should suppose, considerable protection, every tree was dead of the whole twenty-four. I think that demonstrates pretty clearly that for this latitude the Pewaukee is a humbug. I bought of Mr. Tuttle, last fall (and set last spring), fifty Walbridge, all splendid trees, and all did well last summer. Whether they will stand the winter, remains to be seen.

The best trees in my groands stand in grass land and have stood so since a year after being set. The largest Sops of Wine, the one that has borne the most fruit, a Tallman, and a Perry Russet have always stood in permanent grass lands, and they are the best trees I have, and were less affected by the drouth of last season, and the fruit was also the fairest. The best orchard in Portage county, as regards the number of trees, size of trees, thriftiness and quantity of fruit, is that of Wm. V. Fleming, Esq., of this town. This orchard has been in bearing eight or ten years, I should think, and I give it as my opinion that it has been in permanent grass at least ten years. I know another orchard near by, favorably located, I should say, that has the closest attention so far as clean culture goes, not a weed permitted to grow, and yet it is a failure as compared with Mr. Fleming's. I might cite other instances as striking. I have observed that the malady called leaf blight, and which seems to affect the crab species most, is more destructive in cultivated grounds than are trees standing in permanent grass. I would not expect to cut much hay in orchard grounds, but it is a good plan to pasture with hogs whose noses have been wrung. They would keep down the grass sufficiently and not injure the trees.

I mulch my trees with chips, straw or other suitable litter, to keep down grass and weeds. But little will grow, however, under trees of bearing size, the shade being sufficient to prevent vegetable growth. Writers, who affect much knowledge, tell us, clean culture should be had, etc. Now I should like to know how an orchard of ten or more years' growth is to be cultivated. With the trees twenty feet apart the branches must almost interlace, and if headed low, as the same writer also advises us, it would be impossible, except a man should creep on his knees and draw the cultivator behind him, and under the most favorable circumstances

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the cultivation by horse power is attended with more or less injury to the trees, by breaking of limbs or scarring the trunks. But I hold that the most natural as well as the most profitable course to pursue is to plant the trees in well prepared soil, mulch sufficiently to keep down vegetation and prevent a too rapid evaporation and never stir the ground at all.

I dont pretend to theorize, but state the result of a pretty large experience, but one or two reasons occur to me as falling under my own observation, why it is better the ground should not be disturbed. The soil of the prairies and openings when in good tilth, is very light and friable, too much so to make good grass lands. On such lands the small, fibrous roots of trees do not obtain sufficient hold, by reason of its light, porous character, to withstand the action of the wind which rocks and sways the tree about, keeping the roots always loose. Again such soils dry out much quicker than those more compact, and so the tree, robbed of moisture in summer, succumbs to the drouth of summer or the severity of winter. While my orchard was in cultivation I had several trees destroyed in that way. My attention would be called to it by the heaving motion of the ground about the tree during the prevalence of winds. But since I have adopted the plan of simply mulching without any cultivation, loss from such causes has not occurred.

I think the ground about the tree should be kept as compact as possible, no danger of its being too compact, the roots will find their way into it. I planted a tree upon dirt thrown out of a cellar. It was gravel and yellow dirt, and some lime; when saturated with water, quite loose, but, when dry, as hard as iron. That tree in growth beat the trees set at the same time in surface soil.

By the way, there is an apple attracting a good deal of attentention in the neighborhood of its growth, named by the grower "Wolf River Seedling," claimed to be perfectly hardy, a winter apple of first rate quality. It was grown from seed by Mr. Springer, near Fremont, Waupaca county.

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APPLES IN SOUTHEAST WISCONSIN.

BY E. G. MYGATT, M. D., KENOSHA COUNTY, IN WESTERN FARMER.

Having resided near the south line of the State during the last 25 years, and given much attention to the culture, fruiting and hardiness of the apple tree, if I wished to set out an orchard of about 200 trees in Southern Wisconsin my present choice would be about as follows:

SUMMER.

2 Tetofski—tree hardy, fruit tender and delicious.

2 Early Joe—nearly upright, fruit small, fair, fine flavor, season short.

2 Early Harvest—shy bearer. Some believe that our northeast winds without frost will take the young fruit from this and the yellow Bellflower.

2 Sweet June—hardy, upright, good annual bearer of delicious fruit, ripening gradually from the middle of August to the middle of September.

4 Sops of Wine—hardy, spreading, vigorous growing tree; medium size, fair fruit, fine for baking, good for market.

4 Red Astrachan—tree hardy, requires age and good cultivation for bearing; good for cooking and market.

1 American Summer Pearman—hardy and fine, shy bearer, fruit tender—juicy and very rich.

1 Carolina Red June—hardy, good bearer, fruit variable—scabs some.

FALL.

6 Maiden's Blush—tender as a nursery tree, hardy at bearing age, good bearer, splendid market variety.

1 Porter—hardy, good bearer, excellent desert or market fruit.

2 St. Lawrence—hardy and excellent.

2 Bailey Sweet—hardy, slow grower, shy bearer, good fruit.

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10 Duchess of Oldenburg—very hardy, good early bearer, fruit handsome, tender, juicy and pleasant. Should be cultivated both for fruit and stocks for top grafting. The Baldwin, Swaar, Rambo, Wagoner, Wood's Greening, Pound Sweet, Pumpkin Sweet, Drap D'Or and other half hardy and even tender varieties may be grafted on the tops of the Duchess, Winesap, Ben Davis and other very hardy trees, as the English Golden Russet.

2 Autumn Strawberry—hardy and excellent.

20 Famuese or Snow Apple—a well known hardy variety, worthy of extensive cultivation, either for stocks, for top grafting or fruit. Highly prized as a dessert fruit. Not acid enough for the kitchen. In season from October 1 to the middle of winter. It is only the soundest specimens that will keep as a winter fruit.

Mother—with me this stands among the apples as the Seckel among the pears. My two trees, sixteen years old, came through last winter safely and bore good crops. The tree is a slow grower, fruit unexcelled by any apple I have yet seen; size, medium to large, dark red; flesh deep yellow, tender, juicy, rich, spicy flavor. Season, October, November and December.

1 Pound Sweet—a good grower, hardy and productive, excellent for baking.

2 Fall Orange—a vigorous, great grower, good bearer of large fair fruit for kitchen.

WINTER.

2 Yellow Bellflower—hardy tree, excellent pie fruit, if you can get it; sells well in market.

4 Talman Sweet—hardy tree, makes a fine head, only valued for market and baking.

4 Rambo—excellent, well known early winter variety. Should be top-grafted on other hardy trees.

2 Pomme Gris—hardy, slow grower, quality excellent.

4 Hubbardson's Nonsuch—tree hardy, slow grower, annual moderate bearer. Fruit large, red; flesh, tender, juicy and excellent. Season November to February. A very fine apple.

3 Jonathan—hardy, tree, fair grower, medium size fruit, beautiful glossy red color, too acid for some, much esteemed by others.

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6 Westfield Seek-no-further—have 5 trees; hardy, good bearers, quality well known as excellent. Should be carefully gathered and assorted and barrelled to prevent wilting.

20 Wagoner—tree, slow grower very productive annually; generally esteemed as hardy, would probably do better top-grafted on a very hardy variety, highly esteemed as a dessert from October to March.

SPRING.

25 Willow Twig—a very hardy, free-growing variety, great bearer, long keeper, will keep until June, quality second rate. A valuable market fruit in the spring.

30 Ben Davis—for stocks and fruit, a very hardy, free growing variety, fruit medium size, fair and handsome; quality, good second rate. In season from January to April. Decays and loses its good qualities during April. Somewhat overrated as to hardiness, long keeping and quality of fruit. During last winter I lost three of this variety four years old, set as standards and about 100 two years old in nursery.

20 English Golden Russet—for stock and fruit, a hardy, thrifty, erect growing tree, slow in coming to bearing. Have six trees sixteen years old, not much fruit. When gathered assort carefully, pack immediately the sound apples until spring, otherwise it will wither and be a "leather coat." Many do not esteem this apple as a dessert or cooking fruit, but raise it for market.

Wine Sap—for stocks; a thrifty, hardy tree; shy bearer, mostly scabby fruit in the northwest. What good fruit we get keeps until May and is of excellent quality; does not bear well in Northern Illinois and Wisconsin; makes good stocks for top grafting.

2 Rawles' Janet—a great bearer, alternate years, of good spring fruit.

10 Northern Spy—There are many bearing trees of this variety in this vicinity; bearing very full alternate years. None injured by the last winter. They must be 12 to 15 years old on root graft, 4 to 5 on top graft before bearing. This may be a tender tree in the nursery; so are some others which prove hardy when older. Last spring Dr. M. of Milwaukee, showed me barrels of sound apples of this variety in April and permitted me to visit

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his orchard in the suburbs of the city, where I found 30 Northern Spy trees, all alive except one.

This fruit must be carefully gathered and assorted at the proper time, otherwise it will be decaying all the time from October 1st until spring. All bird-pecked, wormy or bruised specimens must be selected for immediate use, and the sound apples barreled up in clean (not rusty) barrels, headed up and kept cool until April, when it will excel in quality almost any other apple known. Good for table, kitchen or market.

There are other varieties of high repute as Plumb's Cider, Pewaukee, Grime's Golden, Coles Quince, Bethlehemite and Lawver, of which I have no personal knowledge.

Some of the varieties killed last winter were: Sweet Bough, Pomme Royal, Benoni, King of Tompkins Co., Smokehouse, William's Favorite, Fall Pippin, Wood's Greening, Twenty Ounce, Drap D'Or, and Baldwin root grafted trees. These are nearly all choice fruits too tender for the northwest as root grafts, but many of which would do well as top grafts on hardy trees—not on seedlings, but well proved hardy root grafted trees. The Baldwin and Swaar are producing fine crops here as top grafts. The R. I. Greening is hardy top grafted, but drops mostly before it is mature.

SMALL FRUITS.

BY REV. P. S. BENNETT, APPLETON.

The culture of small fruits as a business, except that of the grape, dates back but a few years. If we desired to fix upon a a period when not more than three or four varieties of either the strawberry, the raspberry, or the blackberry were known, we could probably do so by drawing upon the memory of some in this room. Indeed the writer well remembers when a strawberry was a strawberry, a blackberry a blackberry and a raspberry, either the wild black or the wild red. Nor were these found in cultivated fields and relied upon as a principal means of supporting a family.

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Now in some parts of our country, thousands of acres are devoted to the cultivation of these delicious fruits, and whole trains of cars are loaded with them daily to supply the larger cities The varieties also are so numerous that the question "which shall we cultivate?" is often very embarrassing. I propose in this paper to give the results of some experience and a little observation, both as to varieties and mode of culture.

THE STRAWBERRY.

The strawberry comes first in order. My first attempt was with what I supposed to be Wilson's Albany Seedling. I procured a quantity of plants; set them in the spring, propagated them and greatly enlarged my bed before the first setting fruited. I found myself badly sold, the nearly worthless Neck Pine being the product. Of course, I was not to be whipped, and the next time was bound to succeed surely. I had read glowing descriptions of the Dr. Nicase, the Nicanor, the Col. Ellsworth, the Green Prolific the Agriculturist, the Jucunda, and Russell's Great Prolific. So I went in on all these, principally on the latter. And why not? They were highly commended by the very best authorities, i. e., by those philanthropic souls who had the plants to sell at enormous prices, and by intelligent editors who are first rate judges of this kind of fruit, especially when the best specimens are furnished them gratuitously and well served up with cream and sugar. This was a grand success in the expenditure of money—my berries costing about twice as much per quart as they brought in market.

Since then I have been quite inclined to act upon the advice of the Strawberry King of northern Wisconsin: "If you wish to make money in raising strawberries, plant Wilson's; if you wish to throw away money, plant any variety you please." There are, however, a few varieties worthy a small place in our grounds, provided always we have a sufficient supply of this well-tried, standard variety. These are the Jucunda, the Agriculturist, and perhaps the Charles Downing and Green Prolific.

THE RASPBERRY

Comes next in order, though first in importance. Of eighteen

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or twenty varieties tested in our grounds, we have dropped to about five, with three or four yet on trial. Some of the discarded varieties are of fine appearance and rich, delicate flavor, but they lack one or both of those essential qualities of a good berry—hardiness and productiveness. They are still advertised in fruit catalogues, and some one or two good qualities very strongly stated, while their capital defect is either passed over entirely, or very slightly alluded to.

Thus tyros are misled, and thousands of dollars are squandered or rather go into the pockets of horticultural sharpers. This society cannot too decidedly rebuke such practices. We are the educators of the public in these matters. And they should feel authorized to receive our recommendations, not as the puffs of noisy mountebanks but as the enunciations of reliable teachers.

Among raspberries, *The Black Caps* evidently hold the most important rank. The reputation of the Doolittle, of the Miami, and of the Mammoth Cluster, as productive, hardy, firm of texture, and of good flavor, is well established. They ripen in the order just given. Davidson's Thornless probably ripens a few days earlier than the Doolittle, and if it proves as productive will be of immense value in making up the series. If but one variety is cultivated, there is not much choice between the three first named, especially between the Miami and the Mammoth Cluster. But no one should be contented with any one of these; a succession, a long continuance of this delicious fruit, is of great importance. This can be secured by planting all of the above named varieties, while each, with proper culture, will yield remunerative crops.

The Red Raspberry, in point of flavor, probably excels all others. In some markets it is said to be the most profitable. Of eight or ten varieties of these, sometimes recommended, it is doubtful if any but the Philadelphia is worthy of extensive cultivation. The value of this lies in its entire hardiness and immense productiveness. Had it the firmness and flavor of the Franconia or of the Hornet, we could scarcely desire anything better.

For a time it was hoped that the Clarke would meet all the conditions of a first class berry; but, so far, expectations have not been realized. Its color, size, flavor, texture, are all favora-

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ble; its hardiness doubtful; its productiveness more so. It will, therefore, in all probability, soon be confined to the grounds of the amateur.

There are several varieties of *Yellow or Orange Colored* berries that possess some good qualities, but I have yet to find one that justifies extensive cultivation.

The Mode of Culture is an important branch of my subject, but I cannot here discuss it at length. First of all I would say, thoroughly pulverize your soil. To suppose that, because the raspberry grows wild and without cultivation, it will produce remunerative crops on land half tilled, will insure disappointment. Put in your plow, beam-deep, and subsoil every inch of your ground.

Nor should you suppose that your land is naturally rich enough to produce the best results. To learn that this is a horticultural heresy of unpardonable enormity cost the writer considerable, both in time and money. True, some soils will do better without manure than others, but I doubt if any can be found that will not pay the cost four fold. Besides, many kinds of soil will heave by freezing and thawing and thus throw the roots of the black cap varieties so near the surface as to greatly diminish their productive power.

A heavy mulch may also, in a dry season, save the crop from almost total destruction. Finally, a plantation thus treated will require but little hand hoeing, the cultivator doing the work mainly, and, therefore, a great saving of labor will result.

With us, the practice of setting our rows about six feet apart and our plants about two and a half to three feet in the row, is growing in favor. This gives room for the cultivator between the rows, while the canes in the rows protect and support each other.

Of the blackberry, I have only to say, we are thoroughly disgusted with every variety we have meddled with. These are the Lawton, the Kittatinny, and the Early Wilson. In this latitude, they are utterly worthless, unless it pays to grow fine canes in the summer as sure victims to the frost of the following winter.

My paper has become so extended that I have little room for anything relative to

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THE GRAPE.

The era of its cultivation began before that of authentic history outside the Sacred Record. No fruit is so intimately connected with either sacred or classical associations.

In some countries of continental Europe it is extensively cultinated—and has been for a long period—as a staple commodity, mainly, however, for the manufacture of wine. But its cultivation in this country on a large scale, is of very recent origin. The first adventurerers depending on European varieties and modes of culture, made damaging failures, and thus discouraged all similar attempts for years.

It is now fully demonstrated that few countries can produce better grapes than America; that, with the exception of California (the Eschol of the western hemisphere) few states in the Union can produce better grapes than Wisconsin; and that no part of Wisconsin can produce better grapes than the Fox River valley, extending from Berlin to Green Bay.

The Concord, the Delaware, the Hartford Prolific, some of Roger's Hybrids, the Walter and the Creveling, which are probably all that should be depended upon, luxuriate in the region last named, and properly cared for will produce an abundance of this luscious fruit.

I have a few closing words as to

THE PROFITS OF SMALL FRUIT CULTURE.

If any undertake the business expecting the fabulous returns that are occasionally trumpeted through the papers, they will probably be disappointed, and perhaps retire from the business in disgust.

But if they will enter upon it following the directions of practical men, and exercise a proper degree of common sense, they will after a little delay, receive satisfactory compensation for their future toil, and a reasonable amount *of back pay.*

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GRAPE CULTURE BY AMATEURS.

BY GEN. N. F. LUND, MADISON.

Who are the "amateurs" in grape culture of whom I am to speak? We know that "amateur" is from the French, meaning "*a lover.*" Webster defines it—"a person attached to any particular pursuit, study or science. More particularly, one who cultivates any study or art, from taste or attachment, without pursuing it professionally."

Should we invite the "amateur" fruit growers of the state to come together, probably few would consider themselves included in the invitation. But should we invite all who from "taste or attachment," in other words, the "*lovers*" of fruit growing, we might hope for a large attendance. Such are the true "amateurs," none the less, and need not fear to be named by that title.

What then of grape culture by amateurs? We are happy to report *progress.* First, in extended cultivation. Many are adding the grape every year to their list of fruits. Again, the mode of culture is vastly improved, and yearly improving. Experience has taught us that the commonest varieties may be greatly improved by thorough culture. I have, during the past two years, seen the Concord so much improved in flavor as not to be recognized by those who were daily purchasing that variety at the fruit stands. I have heard a successful grape grower declare that the grape he was eating could not be the Clinton, while a cluster from a vine in the adjoining garden was at once pronounced the Clinton; and yet the same parent root produced both the vines. The choicer varieties are improved by thorough culture, in quantity, size and flavor, even more than the common.

Again, we report *success*, especially in the cultivation of the newer varieties. A few years since only the more common were grown, except by a few experimenters, while to-day I know of no choice grape which can be grown in our latitude, that is not found here, and in some portions of the state many of them in grea

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profusion. May we not therefore claim that we are progressing and in the right direction?

And yet the grape should be more generally cultivated. A *supply* of fruit is what is needed, not *samples;* and while waiting the growth of the orchard, and for the successful apple, this supply must come chiefly from the small fruits, many of which are short in season, while the grape has advantages over most of them. It can be had in greater variety, is longer in season, and as it ripens later than other small fruits, many of the varieties can be kept in fine condition far into the winter, some even until spring, thus giving a season nearly equal with the apple. Still another recommendation is, that it comes early into bearing, giving us fruit the second, third or fourth season, the date of bearing depending chiefly on the quality of the root planted and the culture given.

The mystery so long thrown around the cultivation of the grape has all been dissolved by the practical brain and hand within comparatively a few years, and we wonder now that such false notions could ever have existed. There is no longer any mystery about it, and no more knowledge or common sense is required, than in the cultivation of other fruits, or many of the field crops.

The proper soil for the grape, some writers tell us, is any soil which will grow good Indian corn. This we have in abundance. We have also the native wild vine, and where this is found man should not fear to plant the grape. Certainly, our climate must be favorable, for no finer flavored table grape is produced anywhere. Why, then, may we not have the grape universally cultivated?

The process is very simple. A good root is of the first importance, as with all other plants; deep planting a requisite with our hot, summer sun and dry atmosphere, both favorable for the perfect ripening of wood and fruit. The best possible culture should be given, as this alone will yield satisfactory results. True, the vine may be planted and it will bear fruit if left to care for itself. But such fruit will be "sour grapes that set the children's teeth on edge;" and good culture only should be encouraged.

Discouragements are to be met in grape culture; diseases and

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insects to be fought; but what fruit has them not? Much of disappointment may be saved by the proper selection of a location. A low damp spot, where the air cannot circulate freely, will sooner or later yield a larger harvest of blight and mildew than of ripened fruit; and the insects that infest the vine will revel in the home thus located.

If asked to state from my own experience, what I consider of the most importance in grape culture, I should unhesitatingly reply—*stopping and controlling the growth* within proper limits. This opens the whole subject of pruning, more especially what is so often erroneously termed *summer pruning*. Authors of works on grape culture, who aim to instruct beginners, here become ambiguous, and often as muddy as our street gutters after a shower. I have keenly felt the mortification of errors committed in attempting to follow them. Phin is the only one I have met who makes the distinction between *summer pruning* and *stopping growth* clear and explicit, so that all may understand it.

Properly, *summer pruning* is the removal of large quantities of superabundant leaves and shoots which have been allowed to grow unchecked until the wood is nearly ripened. Many practice this, under the pretense of "letting in the sun and air to the grapes." While grapes will not ripen well, nor vines be healthy under a dense mass of matted foliage, this is not an evil to be remedied by the knife.

These summer pruners should also observe, that all the finer bunches grow and ripen under the shade of the leaves. The sun direct upon the wood or fruit is not necessary to their perfect ripening. Yet the vine, as a whole, should have the full and free benefit of sun and air. Then, if proper training has been given, observation will show the leaves adapting themselves in such a manner as to shield both wood and fruit from the direct rays of the sun.

But, what may be considered as the great evil attendant upon summer pruning, is given by Phin. He says:

"It is the sudden and violent check which it gives to the plants. The roots having been excited into vigorous action by the enormous draft made upon them, find themselves suddenly without a channel through which their unelaborated product can find vent; the balance of product and supply is up

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set, and the fruit is filled with crude ill-digested sap, thus causing it to be unripe and ill-flavored."

Now all the evils of summer pruning are avoided by stopping growth in the shoots and laterals while in the succulent state. The remedy is not the knife, but the thumb nail. On this subject, Phin remarks:

"When we reflect that the amount of organizable matter which can be furnished by any vine is limited, and also that all rank and succulent growth is prejudicial to the production of fruit, we can readily appreciate the advantage of directing the sap to the production of fruit, rather than wood and leaves.

"By early stopping the shoots, and thus preventing the further production of leaves and wood, we render summer pruning unnecessary; no sudden check is given to the vines, the sap is fully elaborated as fast as it is supplied, and the fruit receiving an extra supply of properly prepared sap, (which would otherwise have gone to the production of wood and leaves) is enlarged in size and improved in flavor."

This process of checking growth should commence the first season of planting, by pinching laterals on the first shoot, and be continued each year on every shoot grown. Only a single shoot should be allowed to grow on each plant until the stock is of sufficient size for the bearing canes to be grown. Laterals should be stopped at the first leaf, and as they start again, repeat the process. The entire removal of the lateral as practiced by some, I consider very objectionable. Springing as it does from the axil of the leaf and shoot, its removal leaves a wound where there should be none; as, close beside it the dormant bud is perfecting; and nothing should be done that will disturb its perfect formation. Then again, the dormant bud may *push* if the growth be rank; this is not liable to occur where the lateral is pinched to one leaf.

During the first year, and until the vine is in bearing, it is better, for many reasons, to allow the main shoot to grow without checking, until late in August, when it should be stopped. This insures the full development of the roots, the perfect ripening of shoot and buds, and the leaves will drop from ripeness without waiting for frost. When the vine is in bearing, the shoots should be stopped at from *two to four leaves* beyond the last cluster, according to the vigor of the vine; some varieties requiring greater length of shoot than others, owing to their rampant growth.

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There is one little member of this annual family growth which is usually unnoticed. I refer to the tendril. We tie our vines to the trellis, and as the tendril is only a "twining support," it becomes useless, and hence of no account. But let us give a moment to it, and see if it does not deserve attention. Three years since, in trying to remove a large tendril which had reached out and was clasping a neighboring shoot and its cluster, I naturally found I could not break it. Applying the knife and carefully untwining it, the shoot and cluster were saved from being strangled. The question at once arose: Why pinch the laterals to save superfluous growth, and allow this waste of nutrition in the growth of this tough, wire-like tendril, which is entirely useless? Acting at once upon the thought, I removed the tendrils from my vines, and have since continued to do so, to the evident benefit of fruit and vine.

In my reading the present winter, I have, for the first time, found an author (Mearns), who recommends the removal of the tendril. And a few weeks since I met in the *N. Y. Independent* the following, which refers directly to this subject:

"The tendrils of climbing plants, as is well known since Mr. Darwin's discoveries, are continually making circuits to find something to cling to. The grape-vine tendril is among the slowest in this rotary motion, making a circuit once in about three hours. A recent writer in an English periodical notes the additional fact that if after about ten days the tendril finds nothing to cling to, the motion not only ceases, as Mr. Darwin says, but it soon after dies; whereas the one which finds something early in its search lives the entire season, dying only with the leaves as winter comes. Of course, this comes down to a question of nutrition. * * * Referring to Darwin's discovery of tendril motion, he shows that all motion must take food to maintain it, and useless motion must be a heavy draft on the nutrition and consequent vital power of the vine. When running over trees, the tendrils find support as soon as formed, and thus a great waste of nutrition is arrested and more is afforded for regular growth. This explanation will, perhaps meet this question of life or death in the tendrils referred to. The tendril, after a ten days' fruitless search for something to cling to, exhausts itself and perishes, and because it is thus exhausted it dies within so short time."

You may be sure I was glad to find my theory and practice for the past three years confirmed by such high authority. We here see that tendril growth is very rapid, and though allotted but ten days of life, it consumes a great amount of the nutriment of the

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vine. They will frequently be seen ten or twelve inches in length, and very large where they have found nothing to clasp. They should be removed entire as soon as they start—except on bearing vines, where they should be allowed to remain until all the blossom buds are formed; for we must not forget that "every bunch of grapes commences its formation as a tendril," the premature removal of which would rob us of fruit.

While thus advising and practising the stopping of superfluous growth on all vines by pinching laterals and removing tendrils; and, on bearing vines, stopping the shoots, I am no advocate for removing the leaves from the shoots. I would as soon expect ripe, high-flavored fruit after removing the unripened cluster, as by stripping off the leaf opposite the cluster. I give to the leaves of the shoots equal care and attention with the fruit.

The leaves are the laboratories in which the sap is prepared for the nourishment, not only of the fruit, but of the wood; and without the aid and companionship of the former, neither of the latter can ever ripen.

Dr. Lindley says:

"It would be of no use for a plant to suck food out of the earth by its roots, unless there was some place provided in which such food, consisting principally of *water* and *mucilage*, could be digested and so converted into the matter which maintains the health of the individual. The stem cannot do this, because it is a mere channel through which fluids pass. It is to the leaves that this important office is assigned. They have veins through which their fluids pass, and cells in which they are held while digesting; myriads of little caverns through whose sides respiration is maintained, a skin to guard them from the air, and pores for carrying off perspiration. For the power which the parts of plants possess of attracting fluids, is in proportion to the amount of their perspiration. Now leaves perspire copiously, but the grapes themselves scarcely at all; whence their gradual conversion from a substance of the texture of a leaf into a mass of pulp.

"A leaf is, in fact, both stomach and lungs, and of this we may be certain that neither taste, perfume, color, size, nor any other property, can be given to a plant except through the assistance of the leaves. Strip the ripening grapes of their green garments, and no color or sweetness will be collected in their berries."

And, yet, Dr. Lindley advocates stopping superfluous growth in some cases, and specially instances the vine. He says:

"In this plant the fruit is borne near the base of the lateral shoot, which

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will, if unchecked, go on lengthening and producing leaves to a considerable distance. Now, all the food of such a lateral shoot is obtained from the main branch, which, however, is only capable of furnishing a certain quantity. If the lateral shoot is allowed to grow unchecked, it will consume its portion of food in the proportion of many leaves and some grapes; and the more there is of the former, the less will be the weight of the latter. But if the shoot is stopped after having formed two leaves, all that quantity of food which would have been consumed in the production of leaves is applied to the increase of size in the grapes and the leaves that are left; while the general crop of leaves on the vine will be amply sufficient to prepare those secretions which are to give flavor, color and sweetness to the grapes.

"In vine pruning, the great object is to leave on the shoots just as much force as may be required to secure for the bunches the food that is intended for them, and at the same time to deprive the laterals of the means of expending the food uselessly in the production of leaves instead of fruit."

We have here sound philosophy, and the best of instruction, which many are annually proving, and all would do well to follow. It is from such culture, that the best results thus far have been obtained in the open air.

Under this process of checking growth, about the first of September we find the shoots fully ripened to their tips, as are also the spurs of the laterals (where stopped), the dormant buds are round and full, almost to bursting, and seemingly impatient for the coming spring. The fruit ripens earlier and is often double in size and quantity to that on the unchecked vine, while in sweetness, richness and flavor, there is no comparison.

As our climate has settled the question of winter protection for the vine; the *annual pruning* becomes a necessity at the close of the season; the proper time being, just after the leaves have fallen. For this pruning, I have found one simple rule a sufficient guide in every instance, whatever the system of training may be.

First find where we want a shoot or shoots to grow the coming year. Then leaving one additional bud on each shoot, cut away all others.

Should the buds all grow in the spring, the last one on the spur can be rubbed off. Should one fail, we have the extra bud to supply its place. Following this rule, pruning can be done correctly, and after a little practice, rapidly; and I have found it worth more than all the pages of minute instruction in

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books, or the advice of those who prune without system or reason.

Before covering for the winter the ends of the spurs should be allowed time to season, thus preventing the loss of sap through the wounds, when we uncover in the spring. Doubtless one of the chief reasons why the vine is more successful in fruiting with us, than fruit bearing trees, is the fact that our rigorous winters, *compel* us to give it protection. Thus shielded, it is safe from climatic changes for five months of the year; and when at the propper time we uncover it, its growth is often marvelous. Our hot summers are adapted to the rapid growth required in the full development of the vine and its fruit; while our dry atmosphere and cool nights are especially favorable in keeping them comparatively free from disease.

Of the many systems of training the vine, I have tried several, and carefully examined others; and from experience and observation I give a decided preference to the *horizontal arm and spur system.* The objection to the vertical or spiral cane trained to the stake, is, that the shoots grow laterally; the foliage and fruit droop, and hanging in masses, afford hiding places for insects, collect and hold moisture, thus inducing mildew and other diseases, whereas, with the horizontal arm, the shoots grow vertically and separately; and being spread out along the entire arm, affording free access to the air and wind, the foliage is rapidly freed from moisture. And in checking growth, or if disease or insects attack the vine, every part, shoot, lateral, leaf and fruit can be readily seen and separately examined. On the horizontal arm the fruit grows in its proper position; the largest clusters nearest the base of the shoots. Frequently the lowest will be double shouldered, the next shouldered, while the upper will be a simple cluster.

Some find an objection to this system in the cost of the trellis over stakes. True, the cost is greater, but the trellis does not required to be replaced as often as the stake, and is far safer. Then, again, a costly structure is not needed. After trying several styles for this trellis, I have found one that just suits. It is made of light posts, bars two inches wide, sawed from fence boards, and common lath. The lower bar is placed about a foot from the ground; the upper, the length of the lath above it. To these nail the

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lath, nine inches from center to center, and you have a cheap trellis; good enough for the garden. A coat of whitewash is an improvement, but the vine will soon cover it, and it will only be seen in winter when the grape garden, at its best, is seldom ornamental. If, from these, we can give our friends choice fruit, they will not criticise our cheap trellis.

As to varieties proper to be grown, I have no special list to recommend. We know what succeeds with us at present, and the fear that it may sometime in the future fail, should not deter us from planting it. In selecting varieties, much depends on the situation, more on the wants and tastes of the individual, and the culture he has determined to give. If only the common varieties are wanted, and he has a taste for nothing better, his list is soon made up, and his wants supplied. But the choicest grape is as much to be desired as the choicest of other fruits, and while I can raise the delicate flavored Delaware en masse upon the vine, or the Roger's Hybrids, yielding in their splendid fruit, more pounds to the vine than the Concord or Northern Muscadine under the same culture, with clusters weighing a pound and a half and berries measuring three inches and over, I shall not be dissuaded from planting them under the fear that their foreign blood may some day contaminate them. I consider the tried varieties of Rogers Hybrids the finest fruit that has yet been successful with us.

During the past season I have fruited for the first time in perfection, the much abused Israella, and found it by far the most delicate flavored black grape I ever tasted. Should that vine never yield another cluster, I shall feel that I have been paid for raising it, and will plant again and repeat the process until I find a better. Such returns will not pay for the market, but they may pay one whose partial reward is found in producing the choicest fruit. For two seasons I have been growing the Hybrid Croton. So far it promises well. The wood is firm, the foliage deep green and thick. It may not succeed with us, but from the taste I have had of its fruit, I can assure you it is a thing to be desired. (But I forbear, on varieties.)

The grape, as we have it to-day, is a child of civilization; step by step it has been educated and advanced from the wild vine to its present position among the choicest fruits; and while enjoying

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it, we should rejoice most of all that it has not yet graduated from the school of improvement.

In speaking thus of grape culture, from the amateur's standpoint, I have not given fancy pictures of what possibly might be, something to be hoped for that cannot be realized, but sketches from the garden, and of actual experience.

INJURY TO TREES AND VINES IN 1872-73.

BY C. H. GREENMAN, MILTON.

It would be useless for me to trespass upon your time in adducing arguments to prove that large numbers of fruit trees and vines were injured or entirely killed during the winter of 1872–73. The vacant spaces in orchard, vineyard and nursery rows are unmistakable evidences of the truthfulness of the statement. The list of iron-clads were no exceptions to the wholesale destruction. Trees of one and two years' growth suffered most. The crab-apples, however, generally escaped; a fact worthy of note.

We will inquire into some of the causes that conspired to produce such losses to the nurserymen and fruit growers, which, for the time, seemed to undo all that had been accomplished in naming a hardy list, adapted to this section of country. The rainfall during the months of October and November, 1872, were far below the average, while the early freezing in December prevented the absorption of moisture by the soil. The continued hard freezing, together with the dry thaws of early spring, evaporated a large portion of the moisture contained in the soil, leaving the ground comparatively dry, and this was especially true on gravely and sandy soils, which produced nearly the same effect as that of freezing in the open air.

Trees and vines were injured very little, if any, on clay lands, and their escape is due to the retentive nature of the soil, which prevented the roots from freezing dry. Exceptions were found in either case, and is attributable to hardy roots in the former, and tender ones in the latter. In a block of Duchess of Oldenburg trees, a portion were killed or materially injured, while others in

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the same row were not hurt by the winter, making a healthy growth last season. My spade revealed the fact that the sound trees were on their own roots, while the sick ones were on the seedlings, and had not rooted from the cion. The same is true of other varieties. The crab apples, with very few exceptions, escaped the injury, no doubt from the reason they were on hardy roots, as they root readily, from the cion.

Hence, I attribute the injury mainly to dry freezing and tender roots. I am not sufficiently conversant with vegetable physiology to explain why some roots are tender and others hardy. My experience has demonstrated that there is a great difference in the construction of the roots, varying in different species. Some are composed mostly of alburnum, covered with a thin bark, while others are mostly bark, with a small amount of alburnum, or woody fibre. These vines were injured in their roots, in proportion to the amount of alburnum they contain in their construction. Those with thick bark are the most easily injured by freezing, as well as those which are first affected by mildew and blight. The alburnum will remain sound when the outside bark is entirely destroyed by the winter. From which I conclude that trees or vines in which the bark predominates in the construction of their roots, are tender and are more easily injured during dry winters.

European varieties and their Hybrids, have large fleshy roots, while the Lubrassa is not as much so, and the Cardifolia is the least so of all.

Apple and other fruit trees are similarly constructed. Should this theory prove true, a partial remedy against the recurrence, of similar losses in the future, may be found in producing trees on hardy roots, which with most varieties, can be accomplished by grafting long cions on short roots, planting deep enough to induce rooting from the cions, and with tender kinds by double working.

The great remedy which will prevent the recurrence of similar disasters in the future, especially in the orchard and vineyard will be found in liberal mulching. This will secure the best possible condition in the soil in preventing the evaporation of moisture during the winter, and is so easily applied in autumn and removed in spring that no one need fail in securing his trees and vines against the recurrence of similar disasters.

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HORTICULTURE—WHAT IS IT?

BY O. S. WILLEY, MADISON.

It has been said that horticulture is higher agriculture; illustrated by agriculture as farming with oxen, and horticulture with horses. But this is not granted by the scientific farmer, who will not admit that any industrial pursuit is or can be entitled to higher honors than that of his choice. Admitted as a fact; then I will designate horticulture as the asthetics of agriculture, or the finding of the beautiful in art,—or labors of industry,—the ultimate aim of sensibility.

Baron von Leibig has said: "The scientific basis of agriculture embraces a knowledge of all the conditions of vegetable life, of the orign of the elements of plants, and of the source from which they derive their nourishment." Professor Lindley says: "Good agriculture and horticulture are founded upon the laws of vegetable physiology, and no man deserves the name of gardener who is not master of everything known as to their being."

Horticulture is said to be derived from *Hortus* (garden) and *colo* (I till). I would not question the fact or the truthfulness of my author. Neither do I ask you to give it any weight because I have told you so. It is not essential to know this. But horticulture, in its most extensive scope, is cultivation of esculent vegetables, fruits and ornamental plants, and the formation and management of rural scenery for the purposes of utility and embellishment.

Here is the æsthetics of agriculture. Calling to its aid, for facts and theories of vegetable life, botany; while chemistry tells us of soils; these two, combined together with meteorology, aid us in the gardening proper of our subject, which is but the "act of laying out and cultivating a piece of ground, raising vegetables, fruits and flowers," and we see at a glance the essential elements as a means for its encouragement to be *horticulture scientifically understood*, by which I mean a knowledge of the funda-

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mental principles of the laws which govern vegetable life—the most essential thing to the life and happiness of the average laborer.

Do not understand me as speaking discouragingly of thorough or complete education—far from it. But bear in mind that we talk to that vast multitude who compose a large majority of our population, whose education is far from complete, and chiefly obtained at the common school, with the exception of taking a term or two at the academy or university. To these I appeal. Of what advantage to you now were the weary hours, perhaps days and weeks you spent upon your algebra, geometry, with now and then a groan over trigonometry? These are all well enough in their place, but tell me, you farmers, doctors, lawyers, yes horticulturists, if you now do not think some other study would have been more conclusive to your present enjoyment?

Let us see again; do you have any practical use for that higher mathematics over which you spent so much time? Does it advance your business interest, make you the more enjoyable as a companion, help you to while away your time when alone, or with naught else to do than to "whistle for the want of thought?" But on the contrary, are there not many of the sciences that would enter into your every day life, add joy to your labors, interest you in your every day pursuits, smoothening the rough ways, heal the wounds of disappointed expectations, and, forsooth, as we walk down the valley towards the shadow that knows no ending, still study our favorite themes, learning that there is life and beauty even in the grass that grows or the stem which gathers no moss.

Look for a moment at botany—"that branch of natural history, which relates to the vegetable kingdom; not merely including the nomenclature and classification of plants as some have supposed, but embracing all the phenomenon of vegetable life in their widest extent." This is divided into several divisions, but that of physiological botany comes direct to us, treating, as it does, of "plants in a living or active state," explaining how they are influenced by the several agencies of light, heat, air and moisture, and the nutriment afforded by the soil.

A single tree or plant, yes, a single leaf of a plant affords ample

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study for illustration of the vast scope of the subject. As we consider how it pumps moisture from the ground, up through a long, barren stem, but which contains thousands of tubes, to be again sent on its mission of usefulness in an almost unfelt and unseen mist, floating hither and thither, but eventually to condense and replenish the earth in showers. Here comes then the ever welcome rain, and the little leaf adds its mite of importance in its development. The leaf holds an estimable importance in this great work. If we could only calculate its single value, and even estimate the gross number of leaves the amount in dollars and cents, or quantity of moisture, then we would have some adequate idea of the immensity of our little subject to this universe.

Is there not here a field of labor and research, which the tiller of the soil will do well to heed, and study and consider, and with a full or even partial knowledge of them, will he not be the better prepared to grapple with the laws of nature, and to work understandingly as he tills his stock, grain, or especially his fruit farm?

As previously remarked, I would not discourage thorough education, in the strictest sense of the term, but I may inquire right here, if we are not by the term thorough education, and by its practice in its teachings, tending to educate the farmers' sons from horticulture rather than to the farm and garden to practise it? It is not my province here to mark out in detail the remedy for this in our system of education for the coming horticulturists of our land, but how marked the contrast in our own schools, from the district to the university and college, to those of Europe, where, I am told, almost every university and large city has its botanic garden, but in this "enlightened America," is there a single well arranged collection for the student's use, from which he can gather any correct idea of the great vegetable kingdom, as to where and how plants grow? Can there be any question as to the results of proper facilities to the youthful mind for applications of this nature, in its impressions for after life? Could it be possible for the aesthetics of agriculture to languish by such a course?

But it is said we have not such botanical educational facilities, and cannot have them at once, even if the heart were willing. Then what? I answer briefly: Teach the youth at our common

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schools the principles of vegetable growth. The child is not too young for this, who enters a school room for instruction, and it is of far more importance to the youthful student than to learn that two parallel lines will never meet, or that he must have a pack of drawing cards, whether used or not, before he can be promoted in a graded school.

The great objection to the study of the sciences is made, that it does not discipline the mind, but on the other hand, it must be admitted that it does improve the habit of observation, which, to the thoughtful mind, will yield more pleasure and satisfaction. The endless variety of objects that will attract our attention for closer investigation, will keep in activity all the mental powers, and can the value of such training of the observation be over estimated to the practical, intelligent, progressive agriculturist or horticulturist? I think not.

Teach the youthful minds by practical experience; plant for them an apple seed; show them how, as it germinates, it has a root which avoids the light, penetrating the soil in every direction, seeking, however, as if by instinct, that best suited for its growth, even penetrating the earth to great depths in search of water or special food; and that it has a stem rising above the ground as the root sank below, throwing out leaves, ever turned to the sun's most direct rays; explain the buds, how a portion are leaf and others are fruit buds, which in time may again produce seeds of its kind, and simple as it may seem, you have the seed planted which will germinate into fruitful horticulturists, who ere long will be able to tell you more precisely how plants grow, as well as upon what and how they feed.

I might enlarge upon this topic, and show how the desires and capabilities of educated and uneducated minds differ upon the farm or garden, in the appreciation and enjoyment of its calling, as much as in any other walks of life, or I might show you how a little more knowledge of geographical botany might aid us in forest culture—a work the whole northwest might engage in with energy, pride and profit, and which constitutes labor, both useful and of the most practical importance, in adapting varieties we would raise to soil, climate and exposures. Japan and China have already furnished us with many ornamental plants and shrubs.

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It remains for the coming botanist to discover others that shall outrival in beauty and adaptability those already sent. It is a work of time, experiment and perseverance to determine what will be best suited for our climate.

Again, the advantages or usefulness of botanical education may be noticed as we see and read of the fungi, which are so destructive to much fruit. It is yet an unsettled question in my mind if much of the blight to the fruit trees is not traceable to the same causes.

Wheat fields are sometimes attacked by a disease called smut, only another form of fungus both destructive to the crop and disagreeable to the laborer. I was surprised to learn that a car-load of silk worm eggs had been sent from Japan to France, and on inquiring the cause of so great an outlay, learned that the worms of South Europe were subjects of a fungus attack, and that this expenditure became imperative.

Again this particular branch of botany, as applied to Horticulture, is of special interest to the inquiring mind. I refer especially to fungus growth. I believe about one hundred species are classed as edible, and to the epicure are considered great delicacies. One cultivator alone in Europe had, a few years ago, twenty-one miles of beds, twenty inches wide, devoted to the cultivation of the common mushroom. And how few, or rather how many of the scholars of to-day can distinguish the edible mushroom from the poisonous species.

But you say the labor attending the cultivation of the apple pear, plum, etc., has been remunerated, with such a moiety of success, that there is no encouragement for the effort. It is not for these that I talk alone, nor have I time to reason that point with my hearers, but please bear in mind that horticulture covers a vast field, fruit, flowers, shrubs, trees, vegetable garden,—in a word, it is to make the farm more beautiful for your having lived on it.

Entomology is a science in which the masses should be more familiar. Indeed, I know of none in which the school boy or girl could derive more pleasure than these two, and which would be of more use to the average farmer—studying the structure of plants, and how plants bud, then to add to this the insect work-

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ers, whether friend or foe, and in all their forms and uses, and we have a study that few will fail to appreciate. Once interest the youth, and here his heart leaps with joy as he bounds away to catch the object of his desire as it flies across his path. A full knowledge of them will assist us in applying the remedies for the destruction of our enemies, and view those which we are able to recognize as our friends with a less repugnant feeling.

We should know more familiarly our insect friends, whether the creeping thing that burrows in the soil beneath our feet, the butterfly that flutters in gaiety at noonday, or the songsters of the tree top, making the air reverberate with their music. When we remember that there are within the limits of the United States at least 3,500 species of caterpillars, not to mention the thousands of other classes, including canker worms, codling moths and the like, for it is estimated by an English entomologist that there are six distinct insects on an average to each plant, and though this proportion may not be strictly correct for this country, yet they are producers annually of millions to be their successors; all of which are doing incalculable damage in their varied species to our garden plants, flowers, shrubs and orchards. Do we not here find lessons for study that should be urged upon the attention of the youth, those coming men and women of our land, that they may be the better prepared to battle with the trials that ever beset the fruit grower.

I beseech you not to laugh at the idea of the common people being educated in these sciences. Halt by the wayside; consider well your condition, progress and ambition, and what you may desire your sons and daughters to be. Would you have them content with their calling, able to see knowledge and lessons of instruction in all things? Then throw about them the pleasures of thought, so educate them in their pursuits of life, as the doctor or mechanic is in his. Then will contentment dwell with him, and as a sweet morsel to his taste; he will study well the demands of the tree he plants, how and when to prune; learn to adapt the wants of a tree to its natural elements. The lovers of flowers will enjoy them the more, because they can appreciate the full knowledge of their structure and habits, and if thrown into a strange land, amid a strange people, and stranger vegetable

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growth, they will not feel banished, but finding acquaintances amid the vegetable world; they will store their minds with valuables to bring away, and not merely pass the time, "that enemy of the ignorant and bane of idleness."

It is time that inquiry should be instituted to know why there is not a better system of education to prepare the youth for u se fulness and contentment in their country homes. And especially should this be so in that higher industrial pursuit which we designate horticulture.

The principal lessons to be learned, together with the benefit to be derived from this and similar conventions is to develop thought, which is the beginning of wisdom, and if in my feeble manner I can be instrumental in exerting a beneficial influence upon the mind of any one in leading them to seek after the first principles of knowledge, I shall be content. I have long felt that our great want, and a lesson we were learning very slowly, was knowledge.

Just in proportion as we can educate the masses, horticulture will prosper. We must disseminate among the people such knowledge as will tend to teach and interest them in their daily walks of life. How, you ask, is this to be done? Aside from the manner to which I have briefly hinted, we must disseminate useful literature. Educate them by reading and study, combined with practical experience—horticultural reading, by which I mean the short, practical papers which we find in nearly all our agricultural papers, which relate to the life experiences of the cultivators. Would that I could enforce it upon your minds, that at least one-fourth of the people do not take any paper, one-half only take a local or county paper, devoted mainly to neighborhood or political quarrels, one-fourth take the leading political paper of the metropolis, and about one-half of this number take an agricultural paper, and are informed to some extent in the horticultural demands and its success in the state.

Is it any wonder that agriculture languishes, or that horticulture is no higher up? That trees are planted like posts, and orchards are the tramping ground of cattle, sheep and hogs? That insects take more than their share; yea, the entire crop, and leave us to sit listless by to wonder if things must be so? I beseech you to

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rest not, but push nobly, enthusiastically on and upward. Teach the people that horticulture is not simply the act of planting, but it is beautifying nature.

Have we not all learned by observation at least, that there is far too little attention paid to our home surroundings? Home! no word more dear! Home! what kind recollections of the past it calls to our memory. Home! the place above all others we should cherish and delight to move about in memory's links such thoughts and mementoes as can never be effaced from the tablet of our souls! Have we made for ourselves in the past, are we planning for such an one for the future? Then we will teach our children to make two trees, plants or shurbs to grow where but one grew before, and enquire if we are beautifying our surrounding by planting the isolated clumps of trees, or the stately elm, the noble maple and the spiral poplar to form beautiful avenues along our landed estates? Are there not many here today who remember the noble trees of the homestead with more interest than all else beside, and as you cast your eye of memory back to boyhood days, when perhaps you helped to plant those spared monuments, will you not resolve by the lesson of the past, that, now, this very season, is the accepted time to commence the rural improvement so long neglected? Do you not owe it to yourself, your family and state to let these things be so no longer? By thought upon this subject do we not see that for the best and largest good there should be concerted action? Does not the whole country need renovating upon this subject? I think I am correct in asserting that it does.

In every town, at least county, there should be a mutual land improvement association, the object of which is to improve or beautify the towns and country. First and uppermost should be the planting of trees along the roadsides. This once well done, and all other things will be added thereunto. Its influence will at once be carried into the cities of the dead. How my heart has ached as I have passed these silent monitors in their sad neglect growing up to a wilderness of sumac, briers, thistles and general forgetfulness—seemingly with no hand to care, or eye to pity. Surely, here is a field, broad as the domain itself, and dear; how dear few can tell, but dear to some as the apple of thine eye.

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And how sweet the memory when, in after years, you, the foremost in this field of usefulness, look back upon its labor done, and when you meet in some grove, planted by your hand on yonder hillside, to celebrate the anniversary of its inauguration, in the gray autumn of the year, as the frost has tipped to redness the foliage of these same trees, to brighten the scene on every hand; the sky clear and rich in that eternal blue, only known to a western autumn; you look upon the labor done, and the Master of your association, viewing, with satisfaction, the scene, echoes forth, "well done," and you, in the fulness of your heart, send back the response, for our children's sake.

I am not egotistic in saying that I would take more pride in being the person who should plant a fine avenue or grove of choice trees upon the broad prairie, that should grow up, towering aloft to beautify the face of the earth or ameliorate the severities of the climate, by which generations to come shall be benefited long after I have passed to my home, than to wear the brightest jewels that earth can yield of conquering politicians. Then how

> "Happy the man whose wish and care,
> A few paternal acres bound,
> Content to breathe his native air
> On his own ground."

Horticulture *is* higher agriculture; and makes home more attractive, plants about our dwellings shade, fruit and ornamental trees, adds art to nature by the landscape adornment of our country homes, the winding walks and graceful curve to guide our taste; adorns with bower, vine and creeper the cottage by the hill side, or the mansion, elegant with architectural skill of the millionaire. It serves to adorn in elegant drapery the home of our loved ones gone. It imprints upon the tablet of the memory of every passer by that, though dead, they are not forgotten, for the majestic elm, the drooping willow or evergreen planted tells the tale in words unspoken. Yes, my friends, the vine that climbs, or trails or creeps; the tree that towers aloft, or droops, or spreads wide its branches to catch and stay the breezes that cross our pathway,—are all lessons and indications of refinement which make our homes the Home, Sweet Home, of which the poets sing, Sweet, Sweet Home; there is no place like Home. This is horticulture in its highest sense.

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TOP-DRESSING.

BY REV. W. C. WHITFORD, A. M., PRESIDENT MILTON COLLEGE.

Since twenty years ago some radical changes have taken place in the teachings of both scientific men and skillful farmers in regard to the methods of preparing and applying manures to the soil. Formerly, in leading works on agriculture, the subject of top-dressing was either not mentioned, or was dismissed with a few crude remarks. Recently, the people abroad and in this country have had their attention called to the matter by numerous allusions to it in their journals on farming and gardening, and by the able discussions of practical tillers of the soil. I can well remember when our prominent authorities urged that all barn-yard manures, either in the fresh or fermented state, should be covered quite deep with the plow or hoe in the fields where they are applied.

I wish to refer your minds only to those fertilizers which are produced in our own region of the country, or which can be obtained here at economical prices.

Nothing is better known in agriculture than that different soils require different treatment, as well as different manures, to secure the largest products of the farm and the garden. Our own state furnishes principally three varieties of soil: the stiff clayey, the sandy or gravelly, and the dark vegetable loams. Even in the work of top-dressing these, our attention must be given to their composition and structure, the adaptation of our fertilizers to each of these varieties, the best times for applying them, and the kinds of crops to be raised. I am aware that differences of opinion exist among authors and experimenters on the main points of the subject; but I have endeavored to select and present those views which seem to me to be grounded in scientific principles and the most thorough experience.

To any one giving the least thought to the subject, it will be seen that we have patches of ground in our gardens, and often extensive fields on our farms, the surface of which should not be dis-

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turbed or turned over, sometimes for several years. There is no mode of preserving the fertility of these except by the surface application of our manures. There are certain stimulants or fertilizers, as the mineral, which all admit will generally exert the best influence on all products of our farms and gardens, if they are spread on the top of the ground. The points of controversy are reached when we come to compare the merits of the two modes of applying barnyard and animal manures—the covering and the broadcasting—to our fields plowed year after year.

On what special principles should top-dressing be recommended as the one to be more generally used?

First.—Decomposition of both inorganic and organic substances goes on more rapidly on the surface under the influence of moisture, sunlight and heat; and if the valuable volatile matters in some of our manures can be prevented from escaping into the atmosphere, then their constituents will be more readily prepared for the leaves and the roots of the growing plants.

Second.—Some of our manures have the property of absorbing gases from the air, some of which are very important to our green crops, such as oxygen, carbonic acid and ammonia; and this can be most effectually done when these manures are lying upon the surface. These gases when thus absorbed are washed down by the rains with the fine particles of the manures into the ground around the roots of the plants to be taken up by them. When they are not thus washed down, they are slowly given off directly under or in contact with the leaves of the plants, and are then taken into the sap by the mouths of these leaves, and become a part of the plants themselves. As we consider the fact that by far a larger portion of the food of all our plants is derived from the atmosphere rather than from the ground, we shall see the advantages of this mode of improving their growth.

Third.—Most of our crops, such as grasses, grains, clover, shrubs, young trees, and vines, are very materially benefited by applying certain fertilizers to them after they are partially grown. In such a state it is evident that the soil around them cannot be stirred much or very deeply in covering the manures which you need to apply to them without injury to these crops.

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Let us first notice the surface application of some mineral fertilizers to our fields and gardens. We will begin with lime. This is found in great abundance in many sections of our state, and chiefly in the rocks below our gravel drift. I believe that our soil, especially the prairie, is somewhat wanting in this substance, I judge so from the facts that it is mainly a vegetable deposit; and that wherever it has been used upon this soil in my section, it has produced the most satisfying results. The principal benefits of the application of lime consists in decomposing and preparing for the roots of the plant the humus, or the organic matters, and the flinty particles of our soil. It contains or absorbs from the atmosphere large quantities of carbonic acid, 44 lbs., out of every 100 lbs., of pure limestone. This it supplies as the principal food to the growing plant. It also neutralizes and decomposes the most injurious acids and resinous substances found in our peculiar kind of soil, and it will destroy many of our pestiferous weeds and grasses. It will hasten the ripening of our cultivated crops, especially those of corn and buckwheat, from 10 to 14 days. It has a tendency to sink rapidly into the ground, and operate at some depth round the roots of plants; yet its best effects are seen when kept near the surface. It should scarcely ever be mixed with our barn-yard manures, in our compost heaps, or as spread on the ground, as it speedily decomposes them, and sends off the nitrogonous compounds.

When used in the form of top-dressing, it should be spread some little time after the barnyard and animal manures are applied to the land, and at first in quite large quantities, but afterwards in small amounts and almost yearly. Under favorable circumstances our average crops, during a rotation of four years, do not usually carry off more than 250 lbs. of lime per acre. Yet this is indispensable. Still a larger amount is needed to act directly upon the soil before its decomposed parts are taken up by the plant. The lime obtained in our state is particularly valuable as a manure, since it contains magnesia in nearly the exact quantities which the crops require. This is the yellow substance contained in our limestone and clay. Below some of our peat beds we find a strong lime marl, which can be spread fresh on our fields, and in larger quantities than our burned and slacked lime,

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as it operates more slowly, and probably more vigorously at the same time.

Our best experimenters say that lime should be applied some time before the crop is grown, say, in the fall of the year. Some recommend harrowing it in with our wheat, particularly the winter. On a potato field it can be sown broadcast after hoeing, and on cornfields before or after hoeing. I judge that its uses in the last cases are to kill off the weeds and decompose the vegetable matter in the soil for the growing crop. A compost of one bushel of lime and three bushels of the rich top-soil is used with excellent effect.

As to gypsum, Dr. Franklin was the first to recommend the use of this fertilizer in this country. He sowed some on a hillside in a field of grain, in the form of the words, "Effects of gypsum;" and the rank and stout grain where it was sown, could be seen very plainly, and the words distinctly read. It differs from common lime in having sulphuric acid in the place of the carbonic, in combination with pure lime. Sometimes the wonderful effects of this fertilizer is owing to the fact that it supplies exactly the ingredients the cultivated crop needs; and sometimes it stimulates the inactive substances in the soil, and so they are fitted for the plant. These results often cease after a time, and our farmers are disappointed. To know when to use it is one of the indispensable circumstances in the case. In many sections of the Eastern States, it has been largely used, especially upon pastures and meadows; and, also, upon oats, corn and potatoes. Its value lies mainly in two things: first, as a direct nutriment to the plant in furnishing sulphur, oxygen and lime; second, in its power to absorb moisture and the volatile gases, as ammonia, and yield them up as the plant may demand them. A small quantity lying on the ground or near the surface, will act in conveying the valuable vapors from the atmosphere to the crops, to which it yields these under the influence of moisture and heat. On grass and clover lands, its value is due principally to this effect, though in dry weather it takes up the moisture of the dews and the ground, and retains them for the crop. When it ceases to benefit the land, then other manures containing ammonia, phosphoric acid, potash, soda, magnesia and chlorine, should be applied at once, as it may then be

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known that these ingredients do not exist in the soil, or that they have been exhausted by the crops. Occasionally it is a fact that the soil already contains gypsum in sufficient quantities, or some substance which acts nearly as a substitute, as in many of our prairie lands, so that the use of this fertilizier is not followed by any visible advantage. The amount required to be sown on the land is not large, and varies with the kinds of soil. We are told that it should always be applied on the green crop and in the spring. In this country, it is frequently sown with the seed; or, in the case of potatoes, put into the holes with the farm-yard manures.

As to salt, the worth of this fertilizer is not generally known in my section of the state. Its use for this purpose is very ancient.

Near the sea it is carried inland by the sea breeze, and its effects are plainly discernible. In large quantities it is injurious, destroying vegetation. In moderate amounts it is very valuable. The share of ingredients it imparts to the plant is limited, but this is essential. It is composed of chlorine and soda; the latter being taken up readily by our crops. It is useful as mixed with compost heaps, assisting in absorbing the volatile matters. Dissolved in water and applied to vegetation, it acts powerfully upon those soils containing organic substances which decompose with great difficulty, as our cold and resinous dark colored ones. It breaks up the ammonia and the potash in the ground, and prepares them for the growing plants. It is found to be destructive of the grub and wire worm. It is usually applied as a top dressing, at the rate of four bushels to an acre, to most grain crops. It is particularly useful to wheat; as it makes the stalk stronger and ranker, and the berry bolder, brighter and heavier. It tends to prevent rust, blight and smut. It hastens, undoubtedly, the ripening of the crop by several days; and this advantage is of great account sometimes in this country. It should be sown on the wheat soon after it is harrowed in. Most of our grasses are benefited by it. Our root crops, as beets, asparagus, potatoes, turnips, etc., sometimes double their products after the proper use of this fertilizer. Its effects in some recorded instances on most of the grains, particularly wheat, is marvelous. The great caution to be observed, is not to use too great quantities of it. Three

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bushels of it mixed with five bushels of lime, make an excellent manure for a single acre.

As to potash in our ashes. Some hold that we do not need this fertilizer, on account of the organic substances in our western soils, as the prairie. My experience shows that it is here very useful. My observations have been confined mainly to its effects upon the products of our gardens, as potatoes, corn, carrots, peas, cucumbers, tomatoes, beets, etc. I selected one of the richest places I have ever seen on our prairies, and applied year after year, principally to the surface, all the ashes made from several fires; and my garden stuffs used to be much larger in quantity, and better in quality than any raised by my neighbors. The ash of oak is rich in the following constituents: potash, soda, lime, magnesia, phosphoric acid, with other substances in smaller quantities, as silica, oxide of iron, gypsum, and common salt, all of which are readily taken up by the growing plant. Like salt and lime, ashes run out the poor grasses, and destroy the weeds. Their effect is quite lasting. Many believe that ashes should be first leached before applied. This is a serious mistake. They lose on an average not far from two-thirds of their strength. Around trees, placed in large quantities, they are doubtless injurious. This is owing to their caustic properties, which, in over-doses, destroys vegetation. Ashes can be made valuable in the place of gypsum, in our compost heaps, and in the tanks for collecting the liquid excrements of our domestic animals.

When oats lodge, as they are apt to do upon manured lands, an application of ashes usually saves the crop. While the potash in the ashes is directly absorbed by the plant, it is a powerful agent in dissolving silex or sand, so that it is fitted to be used by the crop. Every bushel of ashes is counted worth a half dollar in this country for fertilizing purposes, and the mode of best applying them should be better understood.

In noticing, in the next place, the use of vegetable and animal manures, I would not forget that, in all probability, the plowing under of dung, mixed with straw, is the most profitable use we can make of these materials in certain classes of soils. Take our stiff clays or clay loams, and, in addition to strong fertilizers, they need the fermentation of our fresh barn-yard manures in contact

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with their particles. The heat and the chemical action caused by this process not only pulverizes the heavy soil, but prepares its constituents to be taken up by the roots of the plants. Besides, these coarse manures hold up several inches of the ground, so that the atmosphere can penetrate it and supply it with such gases as oxygen, nitrogen and carbonic acid, to be imparted to the crop grown upon it. The sunlight is also able to act at some depth, much better upon the soil, and upon the delicate fibres of the plants growing upon it.

I am tempted here to mention a plan for applying farm manures to our prairie loams, which has been tested in my section with the most gratifying success. It partakes of both modes of covering and broad-casting. The dung of cattle, horses and sheep, with the straw which they do not consume, are worked up together in the spring under a partial cover. These have accumulated during the winter in the barn-yard, and have remained generally in a frozen state, and therefore have not been fermented before thus placed in heaps. They are allowed to remain during the summer not affected directly by the heat of the sun, but receiving a portion of the rains. Quite early in the fall, usually after our frequent drouths, they are spread in a rotten condition, twelve to fifteen tons to an acre, upon the fields, as fast as they can be covered by the plow. These fields have been cropped several years in succession. But the practice which gives efficiency to this mode consists in plowing in the dung only two or three inches deep in the fall, and then turning the whole over in the spring about six inches deep.

This method keeps the fertilizers near the surface, so that the atmosphere and sunlight can act readily upon them, and yet so mixed with the soil that their volatile vapors are absorbed and retained in the ground for the succeeding crop. Again, the manures are just in the place where the seed as it sprouts, and the young plant as it grows, can be at once benefited. This method is recommended for our old wheat and cornfields. I would urge its use on other grain fields and in our gardens. Should the farm manures contain seeds from our weeds, they would, in many instances, grow in the fall and be killed off either by the winter or by being turned under in the spring. To follow this course early

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in the succeeding summer, as the crop has received a fair start, by a top-dressing of some mineral manures, as lime and ashes, would increase the productiveness of the fields.

We now reach the question, what are the best modes of applying our barnyard manures to the surface of the soil. Certainly, the course, so often pursued, of permitting our sheep, cattle and horses to roam over our fields during the fall and winter, and drop their excrements upon the ground, is the most wasteful. In this way, as in spreading upon the bare fields broadcast, half rotten, or fresh dung, unmixed with mineral substances which fix and hold its vapors, the ammoniacal gases escape into the air, and the saline matters are washed away by the rains. Besides, the grasses or young grain crops are apt to grow where these droppings are made in a rank form.

The conviction is growing among farmers that our grass and clover fields should be allowed to remain longer in their seeded state than we are accustomed to allow them. To these our farm manures can best be applied in the following form: Secure the complete fermentation of these fertilizers, so that the organic acids in them will absorb the volatile substances. This can always be done by fall; and with sufficient care the winter supply can be made ready by the middle of the spring. In my judgment, the fall application is preferable in our section of the west. The foul seeds in the manures will be apt to sprout before winter, and be destroyed by the cold weather. The covering will stimulate the grasses and clover during the fall, producing larger leaves and stronger roots to resist the action of the frosts and severe winds of our winters; and it will form a considerable protection during that season to the plants themselves.

This course of broadcasting in the fall is doubtless the best one to pursue when you wish to prepare the pasture or meadow for a corn crop to be followed by wheat. After the grasses have been stimulated or strengthened in this way, they can be turned over in the spring for the corn; and not only will the sod be full of roots, but their roots will have drawn up during the fall and kept near the surface some of the minerals and gases which may have sunken quite deep in the soil.

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An acquaintance of mine, who is an experienced farmer, urges the practice of allowing the meadows of grasses and red clover to grow uncropped after the summer cutting, and the products to fall down covering the ground and rotting on the surface during the fall and after the frosts of the winter. He claims that year by year he secures a greater income than by feeding these meadows late in the summer and during the fall. Surely the extra growth will furnish a good protection to the soil during our bleak winters and sudden changes of the spring. In case of the clover, the new growth will supply seed for the meadows, when the roots may have been destroyed by the cold weather.

In our sandy soils, while it is doubtless best to plow in well rotted manures just before the seed is sown or planted, the application of the same kind of manures to the surface, if the season is somewhat moist, is recommended to be done after the crop has obtained a fair start.

But it is my opinion that the most profitable method, all things considered, of top-dressing with our common manures, is to apply them in the liquid form from a cart or machine made for that purpose. Large tanks can be constructed at our barns, just as rain-water cisterns are made, into which all the excrements of our animals can be turned. If the urine does not supply enough liquid to dissolve the solid manure, water can be poured in as caught from the roof of the barns, or pumped from the wells.

To prevent the escape of the volatile matters, handfuls of gypsum and other fixing minerals can now and then be thrown on the surface of the decomposing mass. Then the rich liquid can be pumped out and distributed just at the times the growing plant demands the fertilizers. This mode has been pursued with excellent results by Mr. Mechi, in England, and by farmers in New Jersey with whom I am acquainted. The special advantages are apparent. Besides furnishing the manures at the proper time, they are in a condition to be promptly absorbed by the roots and the leaves of the plants, as they are dissolved in water, and each plant can select from the liquid the ingredients it most needs.

A single fact ought to convince us that this is a superior mode. Our vegetation can draw from the atmosphere all the principal substances which it requires for its growth, except nitrogen and

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phosphorus and their compounds. These must be furnished from the soil, or from the liquids which come in contact with the roots. While the nitrogen or its compounds, ammonia and nitric acid are not found in great abundance in our crops, yet they are very essential to their growth; and phosphoric acid constitutes from seven to forty-nine per cent. of the ashes of our most common field and garden products. These constituents are found in the urine of animals, and are absorbed and retained in the liquids and the minerals put into the tanks at the barns.

CONIFEROUS TREES AND TREE SEEDS.

COMPILATION AND REVIEW OF SOME OF THE LAWS THAT REGULATE THE GEOGRAPHICAL DISTRIBUTION OF CONIFEROUS TREES, AND AFFECTING THE VITALITY OF TREE SEEDS.

BY H. M. THOMPSON, ST. FRANCIS.

The various demands of different varieties of trees for plant food to insure healthy growth, is of such a nature as to require some consideration of the composition of soils and the elements that enter into the construction of plant fabric, the vitality and germinating power of seeds, and other conditions requisite for the development of plant growth.

In natural forests, the distribution of the different families of trees may be taken as an indication of the composition of the soil in which they are found growing. This is exemplified in the maples, hickory, walnut, ash and elms, which almost invariably accompany alluvials, or other soils which contain a large proportion of vegetable remains, in forms and combinations in suitable conditions to be absorbed into the circulation and for conversion by assimilation into plant fabric. Although only a portion of the elements that produce this formation are derived from the soil, the kinds, quantities and proportions are of vital importance in assisting and combining with the ammonia and carbonic acid derived from the atmosphere.

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The most important of the ingredients and elements extracted directly or indirectly from the soil consist of different proportions of potash, soda, lime, ammonia, carbonic and sulphuric acids, the phosphates and insoluable silica. The specific quantity of each of these constituents that are converted into plant fabric, differs with the various sorts of trees, as has been determined by elementary analysis of the ash of the wood of the elm, sugar maple, etc., which contain a large relative proportion of those constituents that are derived from the decomposition of organic matter existing so abundantly, and with very little silica, which is contained in small quantities in alluvial and kindred soils, in which humus predominates.

Soils are variable in their power of absorbing moisture, and are also variable in the degree of retention after absorption, as instanced in one soil containing a large proportion of silex, with no underlying strata of argillaceous earth, may absorb all the moisture consequent from a heavy and long-continued fall of rain, but because of its porous structure the most of this moisture is removed by leaching, or by evaporation when exposed to the influence of heat or an arid atmosphere. Another soil, containing the same quantity of sand composed of finer particles, commingled with humus or agillaceous earth, may not have the same absorbative power as the soil containing the coarser material, but will retain the moisture absorbed for a greater length of time under exposure to the same atmospheric influences.

The retentive power of different soils may be illustrated by reference to the results of the experiments of M. Schubler* with sillicious sand, calcareous sand, gypsum, sandy clay, stiffish clay, pure clay, calcareous soil, garden earth and humus. The parts of water in each of these soils being represented at 100, the temperature at a certain degree, the volume of evaporation after a specified time was determined to be the greatest in the first named soil, and diminishing gradually in the order named, and ending with the humus, which evaporated the least; demonstrating that the retentive powers, being in inverse ratio to the amount of evaporation, is based upon the constituents of the soil, and that, as the gradation between these classes of soils vary in the proportion

* Boussingault's Rural Economy, 215.

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of constituents and different degrees of fineness of the particles, so, in like proportion and gradation, must be the power which soils possess in retaining moisture, subject to modification by solar and atmospheric influences.

Porous soils, by reason of the interstices existing between the particles, have the further capacity of receiving and holding a lesser or greater volume of air with its combinations of ammonia and carbonic acid. "These gases are also washed out of the atmosphere and precipitated into the soil by rainfall," the ammonia being attracted to, and retained by the particles of soil, and thus with the acid, is at hand in large volume, and in available form for absorption by the roots of those plants or trees thriving in this class of soils, than in more compact argillaceous soils in which clay predominates.

Soils also differ in their "power of attracting moisture from the atmosphere," as well as in their ability to absorb and retain heat, these respective powers depending in the first instance upon the degree of porousness and the "delequiscent salts," and quantity of humus; and in the other instance the powers are dependent upon the declination of the surface, and the constituent properties of the soil, it being determined by the experiments of Schubler, that the calcareous and the silicious sands have the greatest, and humus the least capacity for absorption and retention of heat.

In this review of the absorptive power established by natural laws, as explained by eminent physiologists, it is concluded that the variant absorptive powers existing in soils, are dependent in their degree of development, upon the influence of climatic conditions, and as most sorts of young seedling trees, vary in their requirements for different degrees of heat and moisture, their adaptation is determined and based upon such of those conditions as are suited to the requirements of individual kinds of trees in their early stages of growth.

The spruce, pines, junipers, etc., in their native forests, are found growing in sandy soils, which contain an abundance of silica, a product that is found in the ash of the wood of the hemlock, and other coniferous trees, five to ten times in excess of the quantity contained in the ash of the wood of the elm, the maple, etc., growing in alluvial soils. This fact partially accounts for the state

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ment of Liebeg, "that coniferous trees growing in sandy soils, thrive better than deciduous trees growing in the same soil."

The adaptation of sandy soils, in which the inorganic matters predominate, and possessing all those absorptive powers, is manifested in the northeastern group of conifera encompassed on two sides of a triangle by the waters of the river and gulf of St. Lawrence, and the Atlantic; the Ontario belt with two sides of its outskirts bounded by the lakes; and the peninsular groups of Michigan and Wisconsin. The bodies of water outlaying these forests, by means of evaporation, charge the atmosphere with a supply of moisture that is requisite for the natural propagation of evergreens, which exhale moisture and "absorb carbonic acid during every day in the year;"[1] the carbonic acid conversion into carbon in plant fibre, being sooner evolved by the more rapid decay of organic matter, in a *moist* than in a *dry* atmosphere, the combined action of moisture and carbonic acid producing a gradual disintergration of the silicates, rendering them soluble, and "physically saturating the component particles of soil with ammonia, potassa, phosphoric and silic acid,"[2] being thus rendered into forms suitable for plant food.

In the Rocky mountain belts, similar conditions of soil and moisture accompanying growth, the moisture being derived from the winds of the Pacific, in arising and passing over the mountain summits, the temperature is lowered, and the moisture is condensed and is precipitated in the form of rain and snow.

It may therefore be said that the inference is manifest that the geographical distribution of trees, is determined by general physiological laws; that the condition of such law or laws are, the intervention of certain climatic influences, and a soil or earth formation abounding in those primitive earths, or those distinctive properties that enter into, and are essential to the development of the characteristic properties and substances of the plant fibre of that particular tree.

The most of the ingredients and elements contained in the alluvial, which may be considered the best vegetable type of soil, may be essential to the growth of all trees, but the same quantity

[1] Liebig's Letters on Chemistry.
[2] Natural Laws of Husbandry, 81.

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of each of these constituents may not be vitally necessary to each individual of the species; this is illustrated in the growth of the leguminous plants, beans, peas, etc., and the cereals, buckwheat, rye, etc., producing abundant crops when growing in sandy or other soils deficient in organic matter; when potatoes, corn, barley and wheat, growing in similar soil, would result in an unsatisfactory growth. In these instances, the difference in growth is attributed to the adaptation of different plants to soils in which are contained diverse proportions of organic and inorganic elements, requisite for the development of plant-fabric, corresponding with the quantity of each of the several constituents that are derived from the soil and contained in the organism of the perfect plant.

The demands of most trees may be the same as regards the kinds of nutriment, but the proportions of nutricious substance demanded by one sort of tree, may be greater or less in amount, than in the other, and some kinds making a slow growth in the first years of plant life do not require as much nourishment in the early stage of growth, as in after life when the growth becomes more vigorous. This difference in the quantity of mineral and organic substances required by different trees, may be illustrated by reference to many of the vegetable products, such as beets, carrots, cabbage, potatoes, etc., which make a life growth in one season, and must necessarily require a greater quantity of food in such condition as to be readily assimilated by the plants in so short a time, than other plants making a growth of only three or four inches in the same length of time.

The difference in the growth of various kinds of young seedlings may not be as great as between them and tuber plants, yet the distinction in the first years growth of the conifera, junipers, birch, etc., and the growth of the red and silver maple, walnut, ash, cotton wood, etc., is strongly defined; the one class of trees making a growth of one or two inches, and the other class growing to the height of ten to thirty-six inches in the same season. Hence in preparing soil for the reception of tree seeds, the application of manures containing more elements of plant-food than is necessary to promote growth, or in quantities greatly in excess of the current demands of any particular plant, shrub or tree, must result

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in loss of material by decay, and the decomposition and partial evaporation of ammonia and other gases, and waste of other plant-food by being carried off, by rains, from soils having an uneven surface, and by sinking deeper in the soil.

In the renovation of sandy soils, deficient in potash in available form, or a soil in which the potash has become exhausted, the application of vegetable mould, peat, muck and wood ashes, furnishes the organic constituents of plant food, which is gradually reduced, by slow decay, into conditions, not only adapted for assimilation into plant-fabric in all species of trees, but more particularly suitable for the nourishment of all those kinds which make a slow growth in the first years of plant life.

The action of the potash contained in wood ashes and its effects upon plants, when applied to the soil are exemplified in the application of leached ashes, upon alternate rows of corn, growing upon land in which the potash had become exhausted by over cropping. The foliage of the rows to which the ashes are applied is of more luxuriant growth, and the color a much darker green, than those on which the application had not been made.

The action of the potash is attributed [1]to its having the properties of absorbing moisture and carbonic acid from the air and hastening the disintergrating plant-food bound up in the soil, and the facility with which plants absorb it, in combination with other constituents, into the circulation, and assimilation into plant-fabric, is effected by conjunction in the absorption of carbonic acid, and transposition through the disengagement of oxygen, induced by the action of light upon the foliage.

On observation of the yellow color of the foliage of plants growing in soils deficient in potash, and comparison with the dark green foliage of similar plants growing in soils having an ample supply of potash, it is possible that it is the base of the other ingredients in combination, that imparts the coloring to all the the green portions of plants, as well as being a necessary constituent, in any other transpositions contributed by its aid, in the complex, and in a great measure undefined evolutions of different substances and elements, in the process of circulation and assimilation.

The supposition is more evident when it is considered that the

[1]Beck's Chemistry, 210-11.

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resins contained in the sap of the conifera, are contained in a soluble condition in the circulation, until its transformation into plant-fabric, by the action of the potash. Although the potash may not be the sole cause, it may be the predominating cause of the green color in vegetation, as is indicated by elementary analysis of the wood and foliage. The ash of the wood of maple, elm, oak and hemlock, contains potash in quantities ranging from 8.65 to 25.93 per ct.[5]

Stoffel's analysis of the ash of the spring and autumn foliage, of the horse chestnut and walnut determines 42.04 and 46.38 parts of potash in the spring foliage, and 25.48 and 14.17 parts of the same substance in the autumn foliage. These results determine the existence of a larger proportion of potash in the spring foliage, when the ascending sap is conveying the food constituents from the soil to the foliage, to be elaborated into chlorophyl; and that the descending sap had abstracted the excess of potash in the foliage, and in combination with the phosphoric acid, and other minor elements transposed into cellulous, and thence into plant-fabric, as is evident from the deficiency of potash in the autumn leaves, and rendered more apparent by contrast of the dark, green hue of vegetation in spring time; with the increasing yellow color of the foliage on the approach of autumn, when the trees have ceased their upward growth. It is further evident that the substance which enters so largely into the construction of the plant-fabric should be contained in the soil in sufficient quantities, in an available form to supply the plant demands, in the assumption of vigorous growth.

In this view of the effects of potash, it should not be presumed that the application of potash upon all soils would be beneficial, from the fact that other soils may contain this substance in ample supply, and may be deficient in some other constituents demanded by the particular tree, for the purpose of supplying one or more of the substances that enter into the construction of plant-fabric.

When it is considered that the most of the coniferous trees make their season's growth in five or six weeks, and that from the time of putting forth of their second leaves, until the formation of the terminal buds, the composition of the plant structure, during the greater part of the season's growth, is of a succulent

[5]Natural History of N. Y., 321-23-37.

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nature, the constituents being in a fluid condition, and the efforts of the plants being simply confined to the formation of wood-fibre, and storing up nourishment for the development of its dormant powers the ensuing spring; the roots and stems of the plants are limited to an extension of two or three inches; it is evident while the plants are in a succulent condition, a great degree of exhilation of moisture must take place from the stem and foliage, and the roots being confined too near the surface of the soil, must have limited powers of absorption, while the continual loss by exhilation must be very great. Hence a soil to meet all these requirements, must possess the power of absorbing and retaining moisture in an eminent degree, and be surrounded by all those climatic influences that favor the propagation of this class of trees from seed.

VITALITY OF SEEDS AND THEIR GENERATING POWER.

Without entering into any speculation in regard to what particular mysterious principle constitutes the life of the embryo plantlet wrapped up in the seed, it may be stated that the various substances contained in, or surrounding the radicle and cotyledons of different tree seeds, consist of resins, oils, gums, wax, starch, gluten, and a "minute quantity of carbon."[6]

The kinds and quantities of these substances, are variable in those constituent qualities upon which the retention of life for indefinite periods of time is founded. This fact has received but little attention, and is in a great measure unaccounted for by vegetable physiologists, any farther than to demonstrate that certain atmospheric conditions will destroy the vital principle by drying or rotting.

These conditions may be considered as extreme; and are an excess of heat and air, and an excess of moisture and air. This proposition may be true in its general application, but indefinite in what constitutes the degree of excess, when applied to any particular kind of seed; as exemplified by contrast of the seeds of the silver maple and mountain ash. The first named seed under the most favorable conditions, will retain its vitality for only a few

[6] Hamilton's Vegetable Physiology, 69.

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weeks, and may have its vitality impaired, or totally destroyed in a few days by exposure to a slight excess of heat and air, or moisture and air. On the other hand the mountain ash seed may be surrounded by a greater degree of either one of these conditions, for the period of two years, and retain vitality.

On the first view, it might be considered that the thickness of the husk is the principal cause on which is founded the degree of resistance to the effects of heat. This view is dispelled by the results of experiments with black and yellow locust, Kentucky coffee and similarly constructed seeds, having no sutures in their shells, and whose germinating powers may be hastened, instead of their vitality being destroyed, by immersion in water at 212 degrees, as would be the result by subjecting to the same degree of heat the seeds of black walnut, butternut, hickory nut, cherry, plum, etc., which have no sutures in their outer coverings.

Again, we find that the seeds of the horse, American and Spanish sweet chestnuts, which have porous shells without sutures, will endure a less degree of heat than any of those seeds having hard woody shells. Again, it is well known that onion seed, which has a much thinner epidermis than any of the above, may be subjected to the same degree of heat as the locust, etc., and result in the radical bursting of the envelope and growing to the length of half an inch or more within five or ten minutes after the operation.

On the other hand, the vitality of the seed of the maples, ash, birch, alanthus, etc., having as thin or thinner coverings than the seed of the onion, will be injured or wholly destroyed by the like exposure to from forty to sixty degrees less heat. Hence it may be inferred that the retentive power of vitality does not depend upon the existence of sutures or the thickness of the husk, but in a large degree does depend upon the substances contained in the internal structure of the seed.

The resins which predominate in coniferous tree seeds, and the oils contained in the seeds of most nut-bearing trees, are liable to have these substances solidified by evaporation when exposed to heat in an arid atmosphere.

The red and silver maple seed contain only a small proportion of starch, gluten and albumen, but abound in chlorophyl already

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formed for entering into the construction of plant fabric; and the germ being in a semi stage of growth, cannot remain in a quiescent state without its vitality being impaired. The sugar maple seed, although similarly formed, and possessing the partially developed chlorophyl, has its radical and cotyledons protected by a coating of albuminous substance, rendering the embryo less susceptible to atmospheric influences.

In the process of germination certain degrees of moisture, heat and air, are the requisite condition for the conversion of the "gluten into albumen, and the starch and oil into sugar." * The lack of heat or moisture in these conditions being destructive; while the absence of heat and air, results in the moisture having no other effect than the swelling of the seed, in consequence of absorption, the vital principle not being destroyed, but simply held in abeyance during the continuance of this condition, at a low degree of temperature.

By experimenting with any one kind of seed, the exact degree of temperature, and the amount of moisture necessary to preserve its vitality may be determined, but these conditions would require modification in their applications to other seeds. In observing the effects of the elements that cause the decay of fence posts, placed at the depth of three or four feet in the ground, it is noticed that after the expiration of fifteen or twenty years, the decay is the greatest, at or near the surface, and gradually lessens in degree, to the end deepest in the earth, which will often be found in a perfectly sound condition.

The results in this instance are attributed to the presence of heat, air and moisture, at or near the surface, and the decreasing volume of heat and air is in an inverse ratio to the increase of depth in the soil, indicating that the absoption of moisture is not detrimental in its effects upon organic structures, unless accompanied with air and heat; hence we may infer the vitality of seed may be preserved for an indefinite period, at the depth of four or five feet below the surface of the soil, or above the surface where the proper conditions are maintained, subject to modification in conditions that relate to the various substances and proportions contained in the organic structure of different seeds.

*Liebig.

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The degree of vitality contained in the germ of seeds, is then dependent upon the conditions of the growth of the parent tree. If the soil is deficient in those constituents requisite for plant growth; or if the soil is deficient in those ingredients that enter into the structure of the seed; or if there be an excess of moisture at the period of inflorescence, preventing the proper distribution and absorbtion of pollen; or too great a degree of heat, and a deficiency of moisture in the earth and atmosphere at the time the seeds should be making their greatest development, the result must be a total lack of vitality in some seeds, and an imperfect vitality in others. Again, when the conditions favorable for perfect development have been attained, the degree of vitality will be farther affected by gathering the seeds at an improper season, or in subjecting them to hurtful conditions previous to planting.

The different degrees of vitality in any one kind of tree seeds, may be exemplified by reference to what is known to all horticulturists in observing the difference in vegetable growth from apple seeds; those plants growing from very old seeds, or seeds saved from fruit too small for market, or seeds from orchards past their prime, resulting in a slow, feeble and stunted growth, when compared with the more vigorous plants produced from the seeds of fruit from healthy young orchards, growing in new or unexhausted soils.

FOREST TREE CULTURE.

BY GEO. P. PEFFER, PEWAUKEE.

Mr. President and Brother Horticulturists: As I have to read you a paper on the above title, but have not read botany nor vegetable physiology, I cannot give you botanical names, etc., but only such local names as are used in common, and terms that I have learned since I have been in this country, and picked up out of newspapers, and observation, memory, and the little experience afforded one while a tiller of our western soils, and a fruit and tree-grower here in Wisconsin; therefore you will excuse my ignorance and mistakes (as there may be many). Mine is a

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rough-and-tumble sort of way of my own, but I hope you will get the idea I want to convey to your understanding and consideration.

In the *Pantagraph* (Bloomington, Ill.), there is an article headed "Forest Preservation," wherein the writer mentions that the government should reserve our woodlands and only sell the timber, and enact laws to protect it so that the timber can grow up again for future generations, or our forests in a short time will all be gone, etc., and he refers to the European laws on forests. As I have some recollection about the laws and the reproduction of the European forests, I will give them, if this paper should not prove too long.

I think if our laws are adhered to, they are just right, and if our timber gets scarce, many a farmer, at least in our section of the country, can grow all he needs, and if of a speculative nature, he will raise it to sell, and make it profitable, as there is a large quantity of poor and waste land to be had very cheap, which can be planted or preserved by the owners, and make forest tree timber growing profitable, which timber will increase in value from year to year, until it is worth as much, or more, than improved farming lands without the timber. If rich land can be afforded to grow timber, all the better, as it will grow faster and for mechanical purposes will be worth more, as the layers of the new wood growth will be larger and of greater strength than slow grown timber.

But before I get into the details, I will remark that fire and cattle have to be kept out for a number of years. On land, either in openings or where the timber has been cut off, or where fire has run over the forest, new seedlings will spring up again naturally, as there are generally live roots and dormant forest seeds left in the ground, which will spring up again; but if nothing of the timber kind should spring up, we have to assist nature and sow the seeds of such forest trees as will be best adapted to the soil, and supply the places by artificial means.

For instance, on very poor, sandy lands (of which our state has a large share), where it is rich enough to grow grass, timber seeds will grow; but if the soil is so dry that no grass can grow, it will be an up-hill business unless water can be supplied. But on the

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very poorest land I have seen in this state (nearly dry sand), the white birch will grow; or on moist sand, tamarack, or larch; and if these should get large enough to shade the ground, other timber seeds will grow, if sown so as to be in the shade, where they grow naturally. Pines are at home on sandy soils, but to start a pine forest, other tree seeds should be sown and grown to produce the shade required for them. If they are to be grown from the seed, or even where small seedlings are set out, *shade* they must have.

I have seen all kinds of land and timber lately, on my first visit westward to our neighboring state, Minnesota, and was surprised to see so much poor, sandy land between here and there, and also the variations of the soil, by the growths of the different kinds of timber, bushes and plants, as we swept along by rail. Some appeared to be so poor that a sheep would starve to death in the month of June, in a ten acre lot. Still, there was always something in the wood line growing on the surface, which could be advantageously cultivated for profit, if not for timber.

The cranberry is at home on low marshes, and grows on land that is wet, three quarters of the year. If that sort of land is improved and drained to some extent, and that crop does not pay, tamarack seeds will grow if the water is drained in early spring, and in a very short time will be a forest if the fire is kept out. Next we find the whortleberry, or low bush blueberry; next, the high bush black whortleberry; next, are willows of various kinds; next, the red swamp birch and alder. On a little dryer soil, yellow birch, tamarack or larch; check or pin oak, white birch, and black pine. These must have shelter when young. Next we find burr oak, black oak, poplar, hazel, black cherry, and occasionally choke cherry. When we get where there are running streams, and where the water has kept out the fire and preserved the underbrush and young seedling trees, we find swamp or white elm, black ash, yellow birch, red, sugar and ash leaf maple, rock and red or slippery elms; and, upon places, cottonwood, poplar and butternut; also, white oak, where the land gets better; pitch or Norway pine, and white pine, and, in rare places, red cedar, and in swamps white cedar, hemlock, balsam, and white and black spruces on a little dryer soils.

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All these different varieties of wood, trees, bushes and vines, can be raised with profit, if a man with a determined mind and good judgment takes it in hand to do so. For instance, to grow forest trees on sandy soils, where there is substance enough to have a covering of grass to hold the ground or sods together, so as to make ridges that will withstand the rains and wind for one season, without washing or blowing away by the wind, we should commence with the seeds of the white birch, as that is about the only tree seed that will stand drift-sand and washings and drouths. If the ridges are made with the plow or spade, they should always be east and west, say from three to five feet apart, and the seedlings will be the best always on the north side of these ridges, as a little shade is started on that side, and as soon as they get well started and a year or two old so as to make more shade, other varieties of evergreen tree seeds and tamarack or European larch, can be sown broadcast.

American larch or tamarack will do best where quite wet; so will white cedar, balsam fir and hemlock, but the spruces and pines of the different varieties of our native sorts, also the Austrian, Scotch and Rocky Mountain, will do the best on dryer and sandy soils, but all the evergreen tree seeds require shade the first two or three years, or until the roots have penetrated deep enough to get moisture to sustain life during the dry and the freezing season.

If there should not be grass enough to hold the ridges required to start the white birches, grass seeds or weeds or grain of some kind might be sown to afford shade enough to get the birch seedlings started. In some parts of Europe, where lands had been abandoned for centuries on account of barrenness and drouth, and nothing could be grown on them, the government employed poor laborers, and skillful naturalists to direct the laborers in growing forests again, and they have succeeded in re-wooding and renovating the valleys that had been depopulated. At first, the work was carrying clay on side-hills and slopes, and depositing it in holes, and watering, to start vegetation and tree seeds, and by following it up year after year, they have now succeeded in covering the hills with timber and the valleys with fruit and grain, as they have now more dew and rain, and the government gets well paid for the undertaking.

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If any one will observe the condition of the land, is acquainted with the climate and knows one variety of tree from the other, he soon can have a forest. He must undertake it understandingly, and select varieties suited to the soil. In this part of the state, where there are many openings, many good pieces or young groves of timber are now seen where 20 or 25 years ago nothing but prairie grass and hazel bushes and a few oak grubs were seen, as the fires always burned everything down from year to year, until the land was taken up and cultivation began; then the fires ceased. Now many farmers have their fire-wood just from thinning out these groves, and the timber is growing from year to year more profitable.

We saw in some of our newspapers an article going the rounds in which the writer sets down the destruction of our pine forests at 17 years hence, and the hard wood at a few years later, in this state; but if we should commence planting or caring for our timber lots now, no such fear would be necessary, for any of us here sees the groves of oak of from 20 to 30 years' growth to be quite large already, many trees large enough for fence posts and other purposes.

If agricultural enterprise should be awakened to this subject, and artificial forests should be planted, they would be more profitable, as they grow much faster than the groves already mentioned.

Trees grown for the wood and shelter on rich bottom lands and prairies, will be needed in a short time to assist the new beginner. First of all, the sod has to be broken, or turned up in ridges east and west, about three to five feet apart, according to the size of the plow, and if soft wood is wanted, it can be raised from cuttings if they are stuck very early, and the land must either have been made ready late in the fall or early in the spring; but if seedling trees are planted and kept back, as in a dormant state, late planting is also successful. They should be stuck or planted close to the north side of the ridge, two to three or four feet apart in the rows, and keep clean of weeds for a few years.

Cottonwood, Lombardy poplar, balm of gilead, red and white willow, and the like, all grow readily from the cuttings. They should be about eight to twelve inches long, and so stuck that

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only one eye is above ground, and in a very short time there will be a forest. In the fourth year thinning out has to be begun and kept up, so as to let sunshine in or the trees would not thrive and many would die; but if one half are cut out in the fourth and fifth years, wood enough can be saved to do the cooking on any ordinary farm, if the grove is one eighth of an eighty acre lot, and in a few years more it will supply all that is necessary, and if one twentieth part of the trees should be standing for twenty years, enough fire-wood could be cut and be of as much value as if the land had been sown with grain, and the cost of raising it deducted.

But as such a lot could be planted with more useful timber, small seedling forest trees should be procured, such as white ash, shell-bark hickory, white oak, black oak and butternut, black locust, red elm and the like; also different kinds of maple, all of which would be more valuable than soft wood, and pay a larger profit for the better varieties planted. If these little trees should be planted every third or fourth row, or in every eighth row, and the soft timber cut out from time to time, it would pay still better as there would be more leaves for mulch, and the hard wood trees would be straighter and better for mechanical purposes. I have in mind a white oak tree, standing in a fence corner, the field mostly cultivated, that has gained in twenty years seventeen and a half inches in diameter. A Norway spruce thirteen years planted, is twelve inches in diameter and is thirty-six feet high. A cotton-wood twenty-three years from the cutting, six feet from the ground, measures eight feet three inches in circumference; Lombardy poplar, thirteen years from cuttings, is two feet and over, and fifty feet high; black walnut, twenty years the nut planted where it stands, no cultivation, is fifteen inches in diameter. But enough of this.

FOREST TREE CULTURE IN GERMANY.

In my native country (New Bavaria, Germany,) the forests are all owned by village corporations, counties or states, and foresters are employed by the government for five, ten or twenty years, as the case may be. These men have to see that no damage is done to the growing trees, to see to the new plantations and to the cut-

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ting of the old forests; to the gathering of the seeds whenever it is the proper time to do so; also to take care of them until they are planted. Each forester has to oversee from 500 to 1,000 acres, which is owned and used generation after generation for forest culture. Whenever a piece is cut down (which is decided on by the trustees of the village, county or state, year after year,) the best timber is used for mechanical purposes, and the balance for firewood. All the government officers and public schools and the town poor are furnished a certain amount free. Then, if there is more cut than is needed for the use of the corporation, it is disposed of at public auction.

When the wood is all cleared off the land is laid off like a village or town, into lots of from one-quarter to one-half an acre, and is sold at auction for the term of three years. The lot with the most stumps on it brings the highest price, as they are all grubbed out for firewood and by this means the land is subsoiled or trenched. Those that buy for the wood only, sell or lease these lots again to farmers or planters that will raise grain, roots or garden products; and they generally manure very highly the first year, in order to make it more profitable. There are many families that have no property but these lots, and upon them they depend for subsistence.

The third year root crops are grown, and then the lots are again replanted with forest seeds. If of rich, heavy clay soils, acorns, beech or white ash are planted. If of sandy or light soils, aspen, birch, blue beech or alder seeds are sown, and in a few years pines or spruce are sown or transplanted. On the last named soils, in our district, mostly white oaks were planted, as there was an oak orchard of about 15 or 20 acres, that furnished sufficient acorns annually to plant 1,000 acres. Lands that had ash and birch forests, when cleared off were replanted with oak and beech, and that of the oak with ash, beech, or any sort that had not been grown on them before.

The nursery of new plantations were planted by the tax-payers or burghers, the same as our road taxes are worked here, and the forester is the overseer. As before stated, the land for the new plantation had for the last crop roots, such as potatoes, beets and turnips in rows, and the furrows left after gathering the crop in

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the fall were used early in the spring to plant the acorns or other seeds in. If too shallow, the hoe was used to make furrows and the seeds covered one or two inches deep. After the seed had come up, and were a good stand, some of the poor people were permitted to grow a row of potatoes or bush beans between them, for the purpose of keeping the tree rows clean of weeds and to transplant the little plants where they had failed. The second year no cultivation is done except to keep the large weeds and grass out. On sandy land evergreens are set out, if there are vacancies.

After the second year all is left to nature. No grass, weeds, or dead forest leaves are allowed to be taken off from the new plantations for at least five or six years, when the first thinning is gone through with and all crooked, deformed and dry trees removed, all in a day or two. This is about the only time the forester must have help to see that none are cut that will be of other use than firewood. As it belongs to the burghers to do this job, there is generally a large crowd, as all turn out that can on this occasion. After a day or two no one is allowed to cut or trim wood or brush for the next two or more years. In the older plantations it is allowable to get the dry limbs and sticks, and the limbs that grow downwards, or interfere with each other. In this way many people have to obtain their firewood, particularly those that are not on the town poor list, as they are not able to purchase it; or if they do buy, do so to have it in cold weather, when the women and children cannot go out to gather it.

I suppose many of you wonder why the Germans from villages or small towns carry their loads on their heads, and why they gather dry brush around their homes in this country. It is because they have been accustomed to it from childhood; and they can make a quick fire and cook a meal of victuals while they set the table.

There are heavy fines and imprisonments imposed for cutting down or girdling or removing little trees or dry leaves from any of the groves, without permission from the forester or trustees, and many a forester has been maimed and sometimes killed, in attempting to arrest parties trespassing on these forests.

In old evergreen forests, the large trees only are removed, and

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if large vacancies occur, the burghers have to make ridges with grub hoe and spade, and remove the surface soil, leaves and rubbish into small piles, when evergreen seds are sown broadcast, and left alone, as these places are mostly shaded. They will nearly all be covered with young plants, and grow up again for future generations.

FRUIT GROWING—CONDITIONS OF SUCCESS.

BY J. C. PLUMB, MILTON, WIS.

The principles of success in this branch of industry and economy of civilized life, are the same in every clime, from Maine to Oregon; from Minnesota to the Gulf of Mexico; but the practice of each locality must be as different, as they are widely separated and differ in climate and soil.

Each locality has its peculiar conditions, and requires its special selection of varieties, and special treatment. Herein lies the necessity of intelligent and persevering experiment, and the value of such experiments to the fruit growing interests of any locality. Leaving theories aside as much as possible, I will refer to some of the facts of tree physiology and their relation to climate, soil and culture.

The tree is a thing of organic life—with its embryo, its infancy, its youth, maturity and decay. It is built up by the addition of cell to cell. It has its circulatory system, of absorption, of assimilation and respiration, and, when once started into life, must be regularly and properly fed. It must have its periods of rest, and its normal rate of temperature as truly as a man; and is more rigid in its demands in these respects than are our physical natures.

Hence the law of adaptation in fruit growing is one too important to be ignored, and which we have not well studied in our practice. Do you want evidence of this? I point you to the decaying and dead fruit trees by the scores and hundreds, not in the glory of hoary age, but in the vigor of youth, and only a brief or

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no fruitage to honor their decay. What means this, but some wrong practice in varieties planted, soil or culture?

But amid this decay, we find instances of success; of whole orchards rarely, but of individual trees. These instances of individual success should to be to us lessons of encouragement. In my experience, the everywhere noticeable fact of these successful trees, has been the sheet anchor which has held my faith firm in the ultimate success of fruit growing in this state, since the shocks of 1855–6, and here we may all tie our faith as long as a single tree stands that is vigorous, healthy and productive.

Success is based, first, on the nature of the tree; second, on its location, with respect to soil, elevation and aspect, and third, its culture and general treatment.

THE TREE.

What are the necessary constituents of a long lived and fruitful tree? It must be well organized; sound in root, body and branch. It must be firmly built, with a native, constitutional vigor and power of endurance for any reasonable burdens of summer's heat and winter's cold, with their alterations and changes, and also the burden of fruitage. These conditions being required, hence the earnest and proper search for adapted varieties.

To produce such trees, we must begin at the very foundation, and secure roots from well proved varieties only. The time was when seedlings were supposed to be all hardy, and this delusive idea much delayed the day of complete success; experience showing that not one in ten is hardy and not one in ten thousand will compare with our "iron clad" list in constitutional hardiness. We doubtless will have a race of seedlings from our Siberians and Hybrids, that will fill all the requirements for hardiness, but so slow and unpractical a process will not meet our present demands. We may secure all the benefits of even this "promise in the future," by our process of root-grafting, and rooting the cion of our "iron clad" at once, so that we know what its foundation is when the tree leaves the nursery. This I deem the most practical and common sense way of growing our nursery trees.

The practice of "double working" or after grafting at any desired height from the ground on these known hardy trees and roots

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is useful only to increase the number of varieties which we may grow in the northwest of doubtful *permanent* utility, half hardy and tender varities.

Under this general head, trees should be grown from the start in a climate similar to their final home. Their growth should be moderate, even in the nursery, where the soil should not be a hot-bed of aluvium, but a firm soil, rich in mineral elements, which give toughness of fibre and maturity of wood to the tree.

LOCATION.

The best soil for the growth of fruit trees in the orchard, in our climate, is the calcareous clay. It is found in best proportions on the oak lands, especially where the mixed oaks grow natively, and especially the oak ridges. This soil possesses its mineral elements in combination with vegetable matter thoroughly decomposed in good proportions. Its subsoil is generally porous, and naturally well drained, yet sufficiently retentive of water. In such soil and subsoil the tree develops the greatest vigor and growth consistent with power to endure our climatic changes.

Our prairie bluffs and ridges have a soil nearly equivalent to the first named, yet often too loose in texture for want of alumnia (clay) or too rich in humus to be called the best for orcharding.

The heavy clay soils of the lake shore region, from Milwaukee north, and of other portions of northeastern Wisconsin, are among the best for permanent fruit growing, when properly prepared by surface and under-draining, ridging and subsoiling, to get rid of surplus water, which produces late growth and wood not well ripened for winter.

The black prairie soils of our state have all the conditions of success, except their excess of humus or decaying vegetable matter, which, with the great amount of heat they absorb, produces excessive wood growth, which is prolonged in autumn, and unfit for the winter's extremes. The remedy for this is to check growth in August and September by some starving process of culture.

Lean, sandy soils produce a feeble growth, but well ripened and hardy. Such soils require a heavy winter mulch to prevent root killing, which should be applied annually, both for winter

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protection and for proper nourishment in summer. Only the strong growing, vigorous varieties should be planted on such soils.

ELEVATION.

Other things equal, the higher grounds will always be found most favorable to fruit growing. Among its advantages are—exemption from frost; free circulation of air in close, muggy weather; tending to exemption from blight, mildew, and all fungus diseases during the period of growth, and, not least, securing better maturity of wood growth and more perfect development of structure throughout the entire tree and fruit. This last means a greater power to endure the changes of winter in any locality where "wintering" is a source of anxiety to the planter.

ASPECT.

As affecting the health of the tree, this is an important consideration. A warm, protected, southern slope is the most unsafe situation known to our climate. It is subject to the greatest extremes of heat and cold in the most trying time of the year—in the months of February and March—inducing an early push of blossom buds and an early maturity of fruit. These two facts alone would condemn such an aspect for the commercial orchardist, as early ripened fruit cannot be retained for winter market.

One says, "my warm exposure produces finer specimens than your cold northern slope." Granted, for the time, but your warm exposure virtually places you in a summer climate equivalent to from two to four degrees less of latitude, which is good for your corn, tomatoes and melons, but not for your winter apples, and you have to come back to winter with your neighbor of the cooler aspect, and, under adverse circumstances, of which he has less than you to contend with.

The most desirable aspect for the health of the tree is the north to northeast. It has a more even temperature the year round; feels less of the wrenching winds from the southwest, and will hold its crop of late fall and winter apples from two to three weeks later in the fall, thus carrying them through the autumn heats, giving them an increased market value thereby. This

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coming to be more and more necessary to profitable apple culture in our state.

Health of tree and value of its fruit considered, a cool, northerly aspect should be chosen. An aspect which has the strongest wind, summer and winter, and the greatest heat of the sunny days of February and March, cannot be the most favorable for fruit trees. Such is the southwestern slope. There are special favors granted to each locality, and few common to all, so that no one need be discouraged by the want of all the most favorable conditions of location with respect to soil, elevation and aspect. There is a law of compensation or self adaptation in nature, which does much to help such out of their trouble. The more difficulties one has to contend with in respect to location, the more careful should he be in selection of varieties, and the character of the trees he plants out.

CULTURE.

Under my third general head—*Culture*—but one general principle can prevail with thoughtful, progressive fruit-growers. The tree must be placed where it can have regular and abundant nourishment either from the native soil, or artificially supplied by the cultivator; and the same careful management will not allow any other crop to grow to the detriment of the tree and its fruit.

In the best average soil for fruit trees, as indicated under that head, for the young orchard, good culture of the whole surface in *early summer* with some hoed crop, and little or no culture in latter part of summer and fall, with thorough banking with soil, and good broad winter mulch retaining frost in early spring, is the sum and substance of "good culture." When the trees are in full bearing and occupy most of the space, the orchard may be seeded with clover alone, the second crop of which turned every two years, will keep the ground in fair condition, provided it has a light dressing of manure the alternate year when not plowed. Buckwheat in the orchard has proved an excellent cultivator, especially if left to decay on the ground. If so done, one plowing in May will suffice for the season, and a thorough dragging and smoothing about the first of June will complete the work, as the self-seeding will clothe ground very soon after. This treatment is

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especially recommended for old orchards that have become grass-bound and are difficult to cultivate.

As a rule for old orchards, the culture of the space between the drip of the tree tops, is of far more importance than that of the soil immediately about the tree—in fact the latter is nothing in comparison to the former in securing growth.

My idea of the coming orchard culture of the northwest is as follows: Have the surface of the ground made smooth and level, or with gentle undulations only, then with the scythe, hand or pony mower, shave smoothly the grass or weeds from the entire surface, every two weeks or less. The crop thus shorn should be used as mulch, either where it falls or nearer the trees. The roots of vegetation thus cropped, will not run deep, nor draw largely from the soil. This treatment may require, on lean soils, an annual top dressing of fine manure, ashes, lime nor compost, to keep up the supply of nutriment, especially in old orchards.

Trees in excessively rich soils must have some starving process applied to prevent excessive and late growth. In such soils permanent grass will be better than culture, but frequent mowing of the crop should be practiced in all circumstances. I think seeding with rye in August, to be pastured in late fall, and plowed in the next May, would be good treatment for such soils.

Pasturing the orchard, in the ordinary sense, is not good practice, as it compacts the soil around the trees in the dryest weather of summer and autumn, preventing absorption and retention of water, and leaving the ground in the most favorable condition for root killing the following winter. Plenty of moisture in the soil when winter sets in is a guarantee of safety to the roots, if retained by mulch.

I have thus briefly discussed the first principles of fruit tree growing, applicable to all our species and varieties, and with the abundant local and general testimony to the special value of varieties to special localities, no one need go astray, or miss the prize of success in fruit growing in Wisconsin.

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WINTER DESTRUCTION OF ORCHARD AND NURSERY TREES.

BY H. M. THOMPSON, ST. FRANCIS.

The severe losses sustained by tree planters in the northwest in the seasons of '56–7 and '72–3, has developed considerable inquiry into the causes which have led to these disasters. Nearly all writers upon the subject have started out with the theory, and based their reasoning and conclusions upon the innate hardiness of particular varieties; hence the idea is prevalent that hardiness of a particulars fruit tree consists in the ability of enduring a maximum degree of cold. The principle herein advanced is, that hardiness is based upon the ability of the particular tree to endure sudden and great extremes of cold and heat, subject to and dependent upon the volume of moisture in the atmosphere, and moisture and air in the soil, method of cultivation, and that extreme cold alone and of itself, will no more affect the vitality of an apple or pear tree than it will that of an oak tree.

It is conceded that different degrees of hardiness are hereditary, and transmissible from the parent tree, by seeds, budding, or grafting, on similar principles that regulate the transmission of hereditary diseases in mankind, and the imparting of creative qualities for generations of descent in breeds of animals, and that all these results have been originated and developed by natural causes, controlled or modified by nature, accident or design, and that the withdrawal or the absence of any of the favorable conditions that contributed to the origin and establishment of any creative quality, disease or trait, must necessarily affect their perpetuation in the man, animal, plant or tree. Thus we find families and races of men, possessing physical organisms so perfectly developed as to give them a long lease of life; removal to another climate or intermarriage with weaker families or races, or lack of proper care for the health of offspring, results in impairing the lease of longevity. So it is with any particular class of trees which are noted as being healthy, vigorous and long-lived in

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a given soil, and surrounded with creative climatic conditions, either in a natural or cultivated state. On removal to another locality the trees may perish before their allotted time.

If the trees are properly planted, the causes which will tend to their destruction in the future, as in the past, originate, and are the result of a combination of the following conditions existing late in autumn, winter and early spring: First. Deficiency of moisture, in one, or both, of the soil and atmosphere. Second. Sudden, alternate and extreme freezing and thawing. Third. Imperfect development of plant-fibre.

In the first instance, after the trees have ceased or perfected their season's growth, evaporation is taking place from the stem and branches, modified in degree by the volume of moisture in the atmosphere, and if the ground be very dry or frozen below the roots, the roots may not be able to supply by absorption, the quantity of moisture sufficient to replace the loss sustained by the stems and branches by evaporation, hence the stem and branches perish while the roots may retain all the functions of vitality.

On the other hand, the volume of moisture contained in the atmosphere may equal or exceed the average of evaporation from the stems and branches, while the soil during autumn and winter may be deficient of moisture. Air is absorbed, filling the interstices among the particles of soil; alternate freezing and thawing takes place, and produces the same deleterious effects upon the roots when they are in contact with air in the soil, as would be the result if the trees were dug and their roots exposed to freezing and thawing, surrounded by air, and not in contact with the soil. Hence, in spring the tops and branches may be in a vegetative condition, while roots are partially or wholly destroyed.

In the last instance, when tree-growth continues until hard frosts in autumn, the different elements and ingredients contained in the sap and designed for the construction of plant-fabric, not having completed their transposition into cellular tissue by assimilation, are in a fluid or semi-fluid condition. The sudden freezing and thawing occurring, checks further cellular formation, and many of the cells, being only partially formed, are soft and spongy. Expansion, by congelation of the superabundant sap, takes place, rupturing the bark and imperfectly formed cells, and

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resulting in impairing or destroying the vitality of the stems and branches.

The continued growth of trees until late in autumn, renders the most hardy trees very susceptible to climatic influences likely to destroy their vitality, especially in those seasons of climatic extremes, which occur in periods of seven to ten years. The cause of late fall growth is ascribed as being due to a warm and wet autumn; to cultivation in the latter part of the season, and to the natural tendency that some varieties have of ripening their wood later in the season than other kinds.

In consideration of the foregoing causes that result in the winter destruction of fruit trees, it is concluded that prevention lies in the adoption of the rule, to abstain from cultivation late in the season, and if the trees continue to grow to prune them the last week in August. This will check growth and enable the trees to perfectly ripen their wood. If the soil is dry or porous, (sand, gravel, calcareous,) the application of mulch will cause absorption and retention of moisture, and will prove further beneficial in preventing the destruction of the roots by the gradual withdrawal of frost in spring.

In the event of a faithful and proper fulfillment of the foregoing conditions, it is reasonable to conclude that after the trees have recovered from the effects of removal, that all those varieties on the list, recommended as hardy by the Wisconsin State Horticultural Society, may be grown as far north as Lake Superior.

CULTURE OF EXOTIC GRAPES UNDER GLASS.

BY J. POLLARD,

Gardener to Hon. Alexander Mitchell, Milwaukee.

I am often consulted by individuals anxious to learn what kind of a glass structure is best to grow Exotic grapes in; also the best location, soil, etc. Accordingly I cheerfully and respectfully offer the following remarks to the members of the Horticultural Society of the State of Wisconsin:

The best form of a vinery, in my opinion, is a lean-to house,

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and the best aspect is south or a little east of south. The ground selected should slope a little in order to secure good drainage. It is very desirable to erect this lean-to house at the base of a hill or north wall, in order to afford shelter during the early and late growth of the vines. The roof should be a fixed one, with angle of 35 or 40 degrees. The rafters should not be less than 20 or 25 feet in length in order to allow the vines ample length to develop wood and foliage. There is no necessity for heavy rafters, which are a great disadvantage, for they obstruct the light of the house too much. The ventilating sashes at the top of the house should be from 3 to 4 feet in width, and continued the whole length in order to be able to ventilate at once the whole house. These ventilators may be so arranged as to open separately by a cord and pulley. The front, back and end walls should be built of brick. In the front wall, under each rafter, openings must be left in order to allow the roots of each vine to penetrate to the open border. The back wall should be from 14 to 16 feet high, the house 14 feet wide and from 3 to 4 feet high in front above the foundation. The front should be of sash glazed resting on hinges in order to ventilate when needed.

It is evident from the extreme severity of our climate that the highest satisfaction cannot be obtained in what I would strictly term a cold vinery. The blustering winds, early and late frosts, all conspire to make a cold grapery uncertain. Therefore it is very desirable to introduce hot water or a brick flue in order to protect from sudden changes, for in cold vineries early growth is often checked by frosts or very cold weather. Also in autumn the foliage is often destroyed in one night. Unless the leaves of the vines thoroughly ripen and naturally fall off, it is certain the wood is not perfectly ripe, and the next year's growth and fruits will be uncertain.

But a very small quantity of fuel is required to protect the cold vinery in spring and fall. One or two tons of coal would be sufficient for a house fifty or sixty feet long, and a very few large sized bunches of grapes would cover the cost of heating the house, which will secure beyond any doubt healthy vines, mature the wood and enable them to produce a large crop the following year.

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The border should be excavated from two to three feet deep and from twenty to twenty-five feet wide, sloping the bottom from the back wall to the outer edge of the border. Then cover the border from four to six inches deep with broken stones. Then cover this drainage with good sod from some old pastures. The roots of the sods must be uppermost. Then commence to lay on the prepared soil in the following manner: Say one-third good, rich, sandy loam; one-third old sods from some old pasture, and the remaining third of old, rotted barnyard manure. To this add a few barrels of ground bone dust, a little lime rubbish from some old building, and some charcoal. This compost would be much better if prepared in the autumn and kept under cover, exposed to the frost. It should be turned several times during the winter and thoroughly mixed in order to have it well pulverized. Commence early in spring to fill the border. When completed and the soil well settled, the border should be from four to six inches above the surrounding ground.

A border of this description, I am assured, would be found, after several years, to have preserved its strength and be capable of doing good work for years to come in producing the most satisfactory crops of grapes.

Now comes planting and training the vines the first year. One-year old well grown vines are preferred; two-year old are more often called for, but in my opinion are not so good as one year old. They are apt to become pot bound, and in such a case the end of the roots rots or dies away, which is a great detriment to plant or vine.

About the first week in April, open a trench the whole length of the house close to the front wall inside. Take the vines and turn them out of the pots, shaking away all the old soil. Examine the roots. If there are any injured or dead, cut them away. Commence to plant from three to four feet apart, spreading the roots out in all directions, covering with well prepared compost. Then water sufficiently to settle the soil about the roots. Cut the vines down to one or two buds. It would be safer to leave two buds in order to be able to select the strongest when they commence to grow. Give plenty of air at all times, through fine days, otherwise the buds might begin to grow too soon for the roots,

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which is a great evil to the vines. As soon as the roots commence to work, so also will the buds push vigorously.

Artificial or natural heat may now be maintained until warm weather arrives, commencing at 50 or 55 degrees, gradually increasing until you arrive at 90 degrees. It is unnecessary to go beyond this, although sometimes it will rise to 100 degrees or more.

As soon as the two buds are fairly started, rub out the weaker one. As the young canes push their growth, attend to tying to the wires. No stopping of the vines is required for the first summer. The object is to grow as long a cane as possible; the longer the cane the more foliage, and the greater the quantity of foliage the more roots are produced in the border. Young canes make but few laterals the first summer, and it is customary with some cultivators to stop these laterals at the first joint. In my opinion this is wrong, for there is nothing expected from the first year's cane, its laterals and foliage, further than to produce a strong, healthy mass of roots in the border.

Be cautious not to allow the house to get hot or scalding; a neglect that would prove detrimental to the vines. Commence to ventilate early and moderately on fine days. Between 4 and 5 P. M. commence to shut off about half the air. Syringe the vines and the whole house. Use a force pump in order to give a little force to the stream of water. Syringing must be conducted according to the state of weather. Three or four times a week is sufficient during the early part of the season, falling off as autumn approaches. Syringe in the evening only; for if the vines are syringed in the morning, drops of water remain on the leaves and sudden bursts of sun in the summer months would most assuredly burn holes in the foliage.

Be careful to close the ventilators every day, about an hour before sundown. There might be a little opening, to the extent of one inch, left on one of the sashes during the night. This little opening helps to condense the moisture, and helps nature in supplying the vines with that most congenial to their wants. Bear in mind to keep the house and border moist, not too wet, for it is a great error to imagine that grape vines must be continually saturated with water in order to grow them well. In my

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opinion this is one of the greatest evils that a great many practice. It is the principal cause of mildew and many other diseases.

The soil within the house should be always kept neat and continually loose by means of the hoe and rake. Continue this treatment until the wood and foliage are nearly ripe. Give more air as the wood ripens, and discontinue syringing and watering gradually until the vines go to rest, which will be about from November 20th to December 1st.

Now cut down the vines to about six inches, if strong; if weak, cut still lower; then cover each vine with soil. I consider it the best covering. At the same time cover the outside border five or six feet from the front wall. Any rough stable manure will do to protect the vine roots from frost.

The second year, as soon as the spring opens, remove from the outside border all the winter covering, uncover the vines within and fork the border, both inside and outside. As soon as the vines begin to grow, give the inside border a thorough soaking of water. Give the house all the air you possibly can until you find all the buds fully developed. Syringe the whole house and vines morning and evening. The vines should receive the same treatment as the previous year. The laterals that show themselves on the leading cane should be stopped or pinched off as soon as the second leaf or joint appears. Continue this at every new joint until the lateral arrives at the seventh joint or tenth. The leading cane should be allowed to grow to the top of the house without stopping. The vines should be fumigated two or three times during the season. Late in the evening is the best time. The tobacco stems should be damped in order to give off a mild smoke.

When the vines are perfectly ripe, cut them down to about six feet if they are strong; if weak, cut down lower. Before severe frost cover the outside border with any kind of stable manure to about the depth of eighteen inches, the heaviest next the front wall, decreasing as you approach the edge; lay down the canes or vines within, and cover the same as the first year.

The third year, as soon as the spring opens, say about the first

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of April, uncover the vines within, fork over the inside border, make everything look neat and clean, curve down the vines in order to allow each and every bud to come alike, and when the buds show their first leaf tie the canes to the wires. The vines will henceforth require the same treatment as in the second year.

Allow from four to six bunches on each cane, according to strength, and when the bunches commence flowering, discontinue syringing the vines until they are fairly set. Keep up a stronger heat and dryer atmosphere while in bloom. When the bunches or berries are well formed, commence to thin out the bunches. Be guided according to variety. Those that set freely should be thinned nearly one half; others that do not set freely should be left until of sufficient size, in order to allow you to select the stronger berry and cut out the weaker. When all are thinned, commence to syringe. Be very careful not to force the water against the young berries, for in such case you would create rust that would be injurious to their growth and maturity. Continue to syringe evenings until the berries commence to color.

In the fall of the third year, cut down the canes to about eight feet in length. Continue year by year increasing the length of the cane until the vine arrives at the top of the house. I assure you, if well managed and attended to, the vines will prove satisfactory in producing good crops for many years.

Be sure not to let the outside border get too dry at any time. Each autumn or fall, when pruning the colaterals, keep as close to the parent plant as possible. Leave two buds; the extreme bud produces a bunch while the lower bud forms a shoot to bear the next year's bunch. The shoot that bears the bunch should have its point pinched out one or two joints beyond the bunch of fruit. The lower or non-bearing shoot should be stopped when it has arrived at the seventh joint. When the fruit is cut the shoot that produced it should be cut off. This will enable the shoot for future bearing, to ripen thoroughly. In fall pruning the next year, carry out the same treatment as the fall previous.

If at any time mildew should make its appearance, sprinkle or strew sulphur over the inside border, keeping a stronger heat and dryer atmosphere for a few days, which is sure to banish all appearance of the mildew.

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In the fall, before the vines are laid down, they should be washed with a mixture of whale soap, tobacco, nux vomica and flour of sulphur. The quantity should be in proportion to the number of vines in the following, proportion: One-half pound of whale soap, one-quarter pound of tobacco stems, four pounds of flour of sulphur; one ounce of nux vomica, ground. Pour on about two gallons of boiling water; let it stand until cool. Give the vines a good coating in spring. Peel off the old, loose bark before tying to the wires. This will be a sure preventive against mildew and other diseases.

HORTICULTURAL LESSONS OF THE YEAR.

DISCUSSION BY SOCIETY AT STATE FAIR.

On Wednesday evening, September 24, notwithstanding very unpleasant weather, a creditable number of Wisconsin fruit growers met at the City Hall in Milwaukee. The general subject for discussion had been announced as The Lessons of the Year.

President Stickney said he had looked forward for months to this fair and this meeting, as a time at which we would meet and bury our favorites. But the exhibition was a hopeful one. We will not have to go back to Crabs and Miner Plums. We have some things to "tie" to. He had not felt very badly over last winter's experiences. It would do us all good. All are apt to get too sanguine, and fruit growers more so, perhaps, than others. We had been growing wild. The winter killing of which we complained had been no real damage; it had only weeded out the tender varieties, of which we were planting entirely too many. Our society was recommending varieties not fit for us. Three years hence we will de better off than if we had not had so severe a winter. The grumbler who will wait and not plant trees, will lose most. All should be encouraged to at once plant all that is needed. We have varieties on which we can rely; let us plant of these at once, to replace losses, gaining all the time we can.

Vice President A. G. Tuttle, of Baraboo, said the experience of

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last winter was not a new one. That of the winter of '55–'56 was similar. There was even greater injury then than now. We might as well say we cannot grow maples or hickories as that we cannot grow the apple. In his neighborhood there were as many trees injured in forests as in orchards. A succession of mild winters had made us careless as to what we planted, and we had lost in consequence; but our main varieties, those long considered hardy, went through the winter uninjured. He looked with confidence to the Russian varieties, of which many were now being tested, and some of our new seedlings promise great value. We must be careful, however, in sending these out; must have thorough tests before sending them out or recommending them. He had been over the state considerably, and found that as he went west from the lake the injury was much greater. His advice was to keep to those varieties which have been fully tested. Let nurserymen grow the new varieties, but not send them out without thorough testing. With scarcely an exception, varieties which came through the winter of '55–'56, came through the last uninjured. We have the Fameuse, best in its season, which, with him, is from October 1 to March 1; the Duchess of Oldenburg, Red Astrachan, Tetofski, etc., on which we can rely.

J. M. Smith of Green Bay, gave the history of some forty pear trees set at Green Bay in 1862, on the south side of a ravine so steep that it was terraced to give place for the trees. The soil was a gravelly clay. For three years the trees were cultivated well; after that they were left alone; have been in grass since. Scarcely any have died, and nearly all have regularly borne. Mr. Smith showed ten varieties of pears from this orchard—among which were White Doyenne, Winter Nellis, Buffum and Buerre Clairgeau.

O. S. Willey asked the experience of those present as to comparative injury to trees in cultivated land compared with those uncultivated. He had seen many orchards in grass less injured than those in cultivated land.

J. M. Smith said his experience was the same. He gave several instances.

President Stickney thanked Mr. Smith for bringing the pears and giving the account he had. It confirmed his opinion that a

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high locality with free exposure, and a deep, loamy soil, not too rich, was best for pears.

C. Waters, of Vernon county, said in his vicinity the older trees were most injured. Trees in grass stood best. Where trees in grass made no growth he would plow strips, say one-third of the surface.

Mr. Osborne, of Oshkosh, referred to Mr. Thomas Meehan's writings on keeping trees in grass, and to the effect of the sod in keeping the soil and roots cool in extreme hot weather.

Pres. Stickney gave two instances of pear trees bearing freely of fine fruit, in each case the tree standing north of and near a bushy topped cherry tree which kept soil under the pear tree and its trunk shaded.

Eli Stilson, of Oshkosh, said the injury to trees was not all from the cold of winter. It was largely from excessive drouth, which unfitted trees for withstanding cold. A tree in sod would not grow so fast, would not require so much moisture and yet would probably have a larger supply than one in cultivated ground. For young trees, at least, he preferred cultivation.

Wm. Finlayson, of Mazomanie, spoke in favor of setting trees on elevated positions—the higher the better. He did not approve of the plan of allowing trees to remain in grass.

Pres. Stickney thought we could sum up the whole matter by saying we wanted to avoid excessive growth and injury from lack of moisture. If we secured matured wood and moist roots, we were safe. In one place one thing might be needed to secure these results; in other conditions a different course would be needed.

J. C. Plumb, of Milton, said we should protect roots of trees from changes of temperature, by winter mulch, and sod acted as such a mulch. He called attention to the fact that in Wisconsin the trees which were killed last winter were killed at the roots, while in Iowa and Minnesota, he understood, the injury was in the tops. He spoke in terms of high praise of the Walbridge apple, a number of trees of which had been growing in Rock and Jefferson counties since 1858, and had proved entirely hardy and very productive.

Mr. Thomas said he had received cions of the Coggswell

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apple, and it seemed the same as the Walbridge in leaf and twig.

Mr. Tuttle spoke at some length on this question, giving all the information yet obtained, which seemed to show that the Walbridge is not the Coggswell. All things considered, he considers the Walbridge the best late keeping apple we have. The tree bears abundantly and seems perfectly hardy. The old trees at Baraboo are still bearing, although badly broken down by overbearing.

President Stickney made some remarks on the subject of marketing fruit. Fruit was being sold in Milwaukee much cheaper than further south. He saw men in the hall who had brought apples to Milwaukee and sold them at $1.00 a bushel when simply barreling them would have enabled them to obtain $2.00 a bushel. He thought the subject one of great importance.

I. J. Hoile said he found the same trouble at Oshkosh. Fruit growers were getting much less than the full value of their fruit, because of lack of care in gathering, or putting up for the market.

HORTICULTURE AT WISCONSIN STATE FAIR, 1873.

BY O. S. WILLEY, SUPERINTENDENT.

To expect little and then to be overstocked with the good and beautiful things of this world's offering, does not often happen; but such was the case in more senses than one in the horticultural department at the state exhibition in 1873. So universally did the opinion prevail that the fruit crop was a failure, that no one connected with the society expected a fine show, but were not slow to express their opinion that this department of the state fair would be a failure, and even your superintendent had believed their assertions, thinking that fruit growing had touched "hard pan," and could only hope that from the ashes of general despondency there might yet arise a bright horizon. But how happy were all, when they again learned how easy it is to be mistaken, and how sure we all were that fruit can be raised in Wisconsin,

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when we saw the big boxes, barrels and baskets unloaded at Fruit Hall.

The professional cultivators were on hand in usual number, but I think with larger collections than usual. I was fully convinced that Mr. Peffer had not lost his interest, for there he was with 124 varieties piled up around him and still not happy for want of room; and friend Kellogg, with 69 sorts, not to mention his innumerable crabs, that he piled up in such profusion that the most casual observer could not help but notice his "crabbish" appearance. These all with his fine show of grapes were good to look upon and deservedly took their share of premiums. There were six entries for the best and greatest variety of apples, Messrs. Baumbach, Thompson, Wolff and the Gould Nursery having fine exhibitions, showing great care in their collections and arrangements.

For best 10 varieties of apples there were seven entries. In this list was a fine show by Thomas Barnes, of Racine, but the list was of special interest to the lake shore and would not be found well adapted to much of the balance of the state. Mr. Kellogg exhibited for best 10, Red Astrachan, Duchess, Fameuse, Talman Sweet, Golden Russet, St. Lawrence, Ben Davis, Utter, Willow Twig, Northern Spy.

A feature of this exhibition of more than ordinary interest was the preservation of a few early or summer varieties in very perfect condition. The Duchess has been considered a very poor keeper, yet here it was in good condition for show. By this I think we may learn a lesson applicable to other sorts. The Alexander shown by Mr. Peffer was the largest as well as the heaviest apple; the Colvert for weight, and St. Lawrence for size vieing for the second honors.

Mr. Peffer showed seventeen varieties of pears, Gould's nursery, seven well ripened sorts, and Mr. Kellogg six varieties of "$5" specimens. Mr. Wolff's pears were also very fine, and took first premium on three varieties.

Plums were in limited quantities. Evidently the "little Turk" had more than his share.

Grapes were shown in great profusion, Messrs. Greenman and Kellogg dividing the honors. I have never seen such a profusion in quantity and quality as were on the tables. Evidently the

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grape is at home on our soil and climate. Mrs. Mitchell's foreign grapes were of their usual superior size and attractiveness.

Among so many Non-professional Exhibiters I cannot name all. They all did well and evidenced the greatly increased interest taken by the amateur growers. There were twelve exhibiters for variety of apples, ranging in quantity from thirty-eight plates, "a fine display" of W. Reed, to seventy-three plates by B. B. Olds. The first premium was taken by J. C. Ackers on eighty-seven varieties; second by E. B. Thomas, on sixty-six varieties; third by J. W. Parks, on sixty-five varieties; while Messrs. Lewis, Jeffers, Starkweather, Pilgrim, Jacobs, Dewy and Ozane, all had creditable exhibitions.

There were 15 entries for 10 varieties, and 16 exhibiters of 5 varieties of apples. E. B. Thomas had 25 varieties of well grown pears, and J. W. Park, 24 varieties, scarcely less attractive; J. Ozane, 17 varieties very fine, and J. L. Pierce 10.

The pears attracted much attention, and many an anxious heart wondered if they cost all they are worth. Is it cheaper to buy or grow, or go without?

The amateurs were not behind in their show of grapes. Mr. Lawrence's 22 varieties, and Mr. Reed's 15, showed plainly there is a taste and an ambition that is guiding the ship of fruit to a harbor of satisfactory results. The Delaware took the lead as a single variety, and the Concord for best three bunches. The committee had a laborious task in making their awards, and "respectfully request the superintendent of the hall to so arrange the classes that one side might be assigned to professionals and the other to non-professionals, and that the single specimen plates be *all* arranged on one table."

Nursery trees were shown in goodly number, and proved an interesting feature of the Fair.

Summer fruits attracted but little attention, and I think will not meet the expectations of the designers until the time comes that the society can hold annual summer exhibitions.

Seedling fruits were shown in goodly numbers, and I think will result in much good. The encouragement for new varieties should be continued.

Fruit is not all that is attractive at a fair, hardly all that is neces-

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sary to make it a success. Indeed, we would be almost lost, were the florists to be taken from us. We cannot spare Mr. Pollard, the enthusiastic representative of Mrs. Mitchell's gardens. His vast collections of rare plants were admired more than ever, and, I have no doubt, were the means of encouraging others to do likewise. The non-professional florists were not so numerous as I desired, but those who made an effort did well, filling a large share of the hall with a choice lot of cut and pot flowers and plants.

The same remark will apply to the professional class, for where all do so well it is difficult to specify the special merit of any. The great difficulty was to find room for so large a display. I will, I trust, be excused by the others, if I express my and the society's gratitude to James Vick, of Rochester, N. Y., for his interest in the floriculture of the state, and the very fine feature of the fair made from his home grounds.

Some features of improvemement for the future have occurred to me, but will mention only one. In view of the limited amount of room and the great labor attending the collecting and arranging of fruit, exhibiters should not be required to have duplicates, when competing for different premiums. I can see no reason for requiring an exhibiter who competes for best ten and best five varieties, to have five of those plates in duplicate, providing he thinks and desires to have the best ten include those he shows as the best five. It only takes up this much more room and causes very much additional labor. There should also be some more distinctive line drawn between professional and nonprofessional florists. Does it necessarily follow that because Mr. A., B. and C. are nurserymen and sell fruit trees, their wives and daughters are necessarily professional florists, when they have no green house and never sell a flower? The present rule obliges them to compete with green houses. This subject needs the light and wisdom of the Executive Committee.

I wish to acknowledge my obligations to H. W. Roby, Milwaukee, for special assistance in the Floral Department.

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TRANSACTIONS

AT

ANNUAL MEETING

OF THE

WISCONSIN

STATE HORTICULTURAL SOCIETY,

HELD AT

Madison, February 3, 4, 5, 1874.

At 8 o'clock P. M., Tuesday, February 4, the society was called to order in the state agricultural rooms in the capitol, by the President, J. S. Stickney, Wauwatosa, who at once delivered the annual address, for which see page 17 of this volume.

At the conclusion of the address, the President introduced Hon. Ed. Searing, A. M., State Superintendent of Public Instruction, who delivered an address on Recreation in Horticulture, for which see page 22.

At the conclusion of this address, the society adjourned until 9 o'clock Wednesday morning. The attendance at this opening session was much larger than in former years.

Wednesday Morning's Session.

The Society was called to order by the President. The exercises were opened with prayer by G. J. Kellogg, of Janesville.

The Recording Secretary, G. E. Morrow, Madison, read his annual report, for which see page 30.

The Secretary announced that there were present Hon. W. C.

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Flagg, Moro, Ill., Secretary of the American Pomological Society; J. S. Harris, of LaCrescent, and P. A. Jewell, Lake City, delegates from the Minnesota State Horticultural Society; and L. Woodard, Marengo, Ill., delegate from the Northern Illinois Horticultural Society, and moved that these gentlemen be elected honorary members of the society, and invited to participate in all the proceedings of the meeting. This motion was unanimously carried.

Reports from various Horticultural Societies in the state were presented, and will be found in subsequent pages.

Dr. E. G. Mygatt, of Kenosha county, the southeastern portion of the state, who was unable to remain throughout the meeting, exhibited several varieties of apples grown by him or his neighbors. He said 20 Ounce, Fall Pippin, Dyer, Benoni, King of Tompkins county, Sweet Bough, Wood's Greening, (a tree 27 years old and a favorite with him), Drap d'Or, Williams' Favorite, and Smoke House, all killed to a greater or less extent in the winter of 1872–73. He thinks very highly of top grafting, and practices it largely; likes grafting on crab stocks if slow growing varieties are selected. Jewett's Red, a desirable apple, keeping until April, does well with him top grafted, as does the Baldwin, and the Nodhead.

President Stickney said the Nodhead was a favorite in New Hampshire. Mr. Finlayson had seen four bearing trees of this variety, root grafted, doing well in Iowa.

OBSERVATIONS.

Reports from the committee on observation were called for. The chairman, J. M. Smith, of Green Bay, made a brief verbal report, in which he said his inquiries into the causes of injury to trees and plants in winter had developed so many conflicting theories and apparently conflicting facts that he had found himself unable to present a report. It was very generally true that trees in grass were injured less, in the northeastern portion of the state, than those in cultivated grounds. In some localities pear trees were injured less than apple trees. One very successful pear orchard was on a terraced hillside, in grass. The Fameuse,

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among apples, had generally stood well. Raspberries were badly killed in the mild winter of 1871–2, and little in 1872–3.

G. J. Kellogg, of Janesville, reported that the more he looked and inquired the less he knew about the causes of the injury in the past winter. Referring to his well known opinion about pear culture generally in the state, he said he knew of but one desirable pear tree of standard varieties in his region. Some seedling pear trees came through the winter uninjured. In one case a row of thirty-five seedling pear trees was planted a number of years ago on the east side of a road running north and south, with the fence to the west, the roots partly in grass and partly in the cultivated soil. Of these about twenty-five are living and doing well. There was much variation in apple orchards. All the society should be a committee on observation. In his opinion the fall drought was the principal cause of the injury. Close soils were better than open ones. Mulching would do good.

Prof. W. W. Daniells, Professor of Agriculture in University of Wisconsin, spoke of the importance of getting all the facts, and keeping these separate from our theories. Let each give all the facts he has; then his theories or opinions as to causes. In his Plants and Animals under Domestication, Darwin has a fine example of this. Through all the two volumes he gives facts; then in one chapter he gives the theory which he thinks these facts establish.

THE SITUATION IN MINNESOTA.

J. S. Harris, of La Crescent, late Secretary of the Minnesota Horticultural Society, on invitation, spoke of the condition in that state. He said: We have met with wholesale destruction. No variety escaped injury. Two or three varieties of apples stood better than others. The Duchess of Oldenburg was one of these. It frequently seemed injured in spring, came out late and then did well. The Tetofoski and Fameuse did well. The last named is very popular. It stood the winter even north of St. Paul. Many varieties we had grown for twelve or fifteen years were put on the dead list by last winter. The crabs were badly injured, in the roots in all cases. All the seedlings from which much had been hoped were gone, except the Wealthy which stood well. Reluc-

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tantly he favored grass in orchards. Minnesota horticulturists were willing to try again, and felt that the loss would do them good. The Minnesota Society sent greetings to her older sister; the horticultural interests of the two states were similar; much could be learned from each other.

Several written reports of observations were presented, which for more convenient reference are given in subsequent pages.

MANURES AND MULCHING.

President Whitford, of Milton College, read a paper on Top Dressing. See page 106.

In the discussion that followed, J. M. Smith, of Green Bay, said he had applied salt to asparagus beds without any apparent effect, except where applied in large quantities it killed the weeds.

President Stickney said he had lost much by covering manure too deep.

Vice President Tuttle said he did not believe in applying manure to trees, as a rule. It often induced excessive growth. Mulching induced the roots to come to the surface.

Messrs. Peffer and Finlayson commended plan of mulching after winter sets in, removing the mulch in spring. This avoids tendency to bring roots to surface. Trees should be mulched when set.

E. H. Benton, of Leroy, spoke of good results of "mulching with the hoe," that is, of good cultivation.

WINTER KILLING TREES.

E. Wilcox, Trempealeau, said he had tried to have an orchard. Had set many trees, one rod apart, in sandy soil. He had trees of 70 varieties, from four to fifteen years old. Last winter trees of every variety except Tetofski, killed more or less. Duchess of Oldenburg killed among the worst; Red Astrachan and Plumb's Cider did better. Tetofski killed in orchards in same neighborhoods; most kinds of crabs were killed. Nursery stock most all killed. Most of the trees root killed. Transcendent crabs killed at roots; the tops were injured, putting out buds and died in summer. He is using apple tree wood for fuel this winter. The late Mr. Gould suggested hardy stocks—from crab apple seeds.

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In future he will use only crab seeds or seeds from hardy varieties.

Mr. Barney, of Mazomanie, spoke of trees dying from root-killing, while other trees, where roots had started from the cions, were uninjunred.

Mr. Finlayson, of Mazomanie, thought we should distinguish between young and old trees. On his sandy soils nearly all were killed. On higher, heavier soil, nursery stock stood pretty well. Much of the injury was done by the late frosts of the spring of 1873. Many of the older trees stood very well.

E. Wilcox gave an instance of an orchard in his neighborhood, on heavy soil, on a ridge. On the top and west side the trees were mostly killed; on the east side they stood better. In Trempealeau county, the young trees generally fared better than the older ones.

O. S. Willey gave instances showing that trees supposed to be on crab roots were killed.

Vice President Tuttle said that trees will kill more readily on sandy or gravel soil than on loamy or clay soil. On the first soil the frost goes deeper. Trees should be set deeper in the orchard than they stood in the nursery. To throw a few shovels full of earth around the base of the tree in the fall will have a good effect.

J. S. Harris, of La Crescent, Minnesota, said that last winter he found the soil frozen to the depth of five feet six inches.

COMMITTEES.

President Stickney appointed the following committees:

On Premium List.—G. J. Kellogg, James Brainerd, J. W. Parks.

Conference with State Agricultural Society.—C. H. Greenman, Sam. Hunt, B. B. Olds.

Examination of Fruits Shown.—E. H. Benton, P. A. Jewell, L. Woodard.

The appointment of a committee to nominate officers being suggested, Prof. W. W. Daniells said the proper mode of electing officers in any such society was by open nomination and ballot. A motion made by him that this made be adopted was unanimously carried.

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AMERICAN POMOLOGICAL SOCIETIEY.

Hon. W. C. Flagg, Secretary of the American Pomological Society, in response to a reference in the Secretary's report, said the society had held but two meetings in the west—at Cincinnati and St. Louis—and none in the northwest. The next meeting, in September, 1875, is to be held at Chicago. It is believed that at this meeting the finest display of fruits can be made, that has ever been seen in America. It is important that the show of fruit should be made a prominent feature of the meeting. He was opposed to the project of establishing a Western Pomological Society. Similar attempts had failed in the past. We seem to need and certainly will sustain state societies. One great work of the American society is to correct the nomenclature of fruits for the whole country. This work is not fully accomplished.

Afternoon Session.

The treasurer's report was received and adopted as follows:

To the Wisconsin State Horticultural Society:

Your treasurer submits the following report of receipts and disbursements for the fiscal year ending February 4, 1874:

	Balance on hand at la. t report	.....	$548 27
Feb.	Received from L. Woodard, N. W. Hort. Soc...	$14 00	.....
Feb.	.....do ..... O. S. Willey, membership	51 00	.....
Sept.	.....do ... .do.... of state for engaving	150 00	
	Interest	21 21	.....
	Total receipts for the year.....	$236 21	.....
	Total receipts and balance.....	.....	784 48
	DISBURSEMENTS.		
Feb.	Per voucher 63, O. S. Willey, copying report...	$100 00	.....
	62, ...do .... for P. O. box.....	1 25	.....
	64, Atwood & Culver, printing....	48 00	.....
Mar.	65, J. E. Tilton, for cuts	70 25	.....
	66, O. S. Willey, expenses to Chicago	17 15	
	67, E. Forbes, engraving.....	62 75	.....
Aug.	D. M. Morrow, postage.....	16 00	.....
	T. D. Plumb, expenses fruit exhibition at Boston	24 00	
			339 40
	Balance on hand.....	.....	$445 08

Respectfully submitted,

GEO. A. MASON.

Madison, February 4, 1874.

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On motion of G. J. Kellogg, the usual appropriation of $100 was made to the recording secretary for compiling Transactions for publication, and for other services during the year.

Vice President A. G. Tuttle, Baraboo, read a valuable paper, the copy of which, through some mistake, has not reached the secretary.

E. H. Benton, Leroy, read a paper on How to Grow an Apple Orchard—see page 68.

ARRANGEMENTS FOR NEXT STATE FAIR.

The committee on conference with the State Agricultural Society made a report to the effect that the State Agricultural Society would offer $800 in premiums in the horticultural department of the next state fair, pay all premiums awarded, and the ordinary expenses of the exhibition; the Horticultural Society to prepare the premium list and appoint a superintendent for the department.

The report was accepted, and the committee directed to notify the State Agricultural Society that its proposition was accepted.

L. Woodard, Marengo, Ill., was called on for his paper on Planting and Cultivating an Orchard. He spoke extemporaneously, in effect giving the paper published on page 66. He also spoke briefly of the late meeting of the Northern Illinois Horticultural Society, especially of the decision to abandon recommending any varieties.

Referring to Mr. Woodard's objection to pruning in March, Mr. Tuttle said he had never seen any sap start from pruning in that month or any time before the buds swell.

C. H. Greenman, Milton, read the paper on Injury to Trees and Vines, published on page 95.

The paper by A. L. Hatch, Ithaca, on Apple Culture—the Situation Reviewed, published on page 71, was read by the Secretary.

Mr. Kellogg said Mr. Hatch ought to be present to help make a list of crabs.

Mr. Morrow expressed his regret that Mr. Hatch was not present. The society did not profess that the varieties recommended by it would do well in all possible places. In addresses and elaborate papers at its meetings, the value of the improved crabs had been strongly presented and their culture recommended.

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Mr. Finlayson thought Mr. Hatch had underestimated the fruit growing capabilities of Richland county. He had found the Haas, Red Romanite, Famuese and other varieties doing well in different parts of that county.

Vice President Tuttle said the answer to Mr. Hatch's questions was obvious. If any one lived where only crabs can be grown, by all means grow crabs.

J. H. Carswell, of Lone Rock, paid a compliment to the energy and interest in horticulture shown by Mr. Hatch.

HEIGHTH OF TRUNK OF TREES.

L. Woodard said low headed trees are not so desirable as those with longer trunks. Trunks three or four or in some cases five feet high will do very well. Six feet would be higher than he would advise. Varieties differed.

Vice President Tuttle said low headed trees would produce more fruit when young; say for first ten years; after that less. He had Fameuse trees, trimmed with low heads, which commenced bearing at five years old; at eight years old bore two barrels each. The low head system will not be found advisable. Some varieties needed much longer trunks than others. A Golden Russet should have a trunk of six feet rather than less. The bodies of trees should be protected by a board on southwest or a wisp of straw.

J. Y. Smith, Madison, said he understood the object of low training fruit trees to be the prevention of bark blight, by shading the trunk of the tree. The plan suggested by Mr. Tuttle would accomplish the same result. Similar protection to peach trees is quite common in the south.

E. Wilcox said leaning the tree to the southwest when set would accomplish the same end.

W. C. Flagg, Moro, Ill., said the shape of the top was more important than the height of the trunk—at least in the latitude of St. Louis. He had planted or assisted in planting 100 acres to apple trees. In the first orchard the top was formed high enough to allow a horse to go under. The central shoot was cut out. The result was the collection of leaves and moisture, causing de-

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cay and death of tree. In the next orchard the heads were started lower and the tops left alone. This would not do with high cultivation, as too much wood growth resulted. In the third orchard a main central shoot was left and the tree trimmed so as to allow the desired number of lateral branches. This is the better form. In our dry climate and hot sun we do not need much light and air in tree. In England and the eastern states thinning out the top is advisable. The trunk of a tree taken from the nursery is often too weak to allow trimming to the desired height. Leave the side shoots for a time; then cut them away. He favored winter pruning and painting the wounds.

J. S. Harris, of LaCrescent, Minn., said some varieties need high tops, as the Golden Russet. We should always save the central stem, and trim up as needed. With the Northern Spy it is impossible to get a short trunk; you may get several, starting near the ground.

EFFECTS OF THE WINTER.

Rev. P. S. Bennett, Appleton, said his orchard of 100 apple trees, one rod apart, was on ground sloping to the north. Most of the trees were uninjured. His pear trees, set in 1862, have done well. They were set deeper than trees usually are. He has Flemish Beauty, Swan's Orange, Buerre Clarigeau, and Vicar of Winkfield. They are little affected with blight. His nursery stock was badly killed. Tetofski, Duchess, Hyslop and Transcendent killed badly. In his vineyard, Concord grapes came through all right, whether covered or uncovered. Some of Rogers' Hybrids killed, although covered. Trees in grass did better than those in cultivated ground. Trees set close together better than those far apart.

L. Woodard, Marengo, Ill., said he found it best to cultivate the soil early in the season, up to July 1 or July 15. After this time let the weeds grow. This plan forces growth early and gives time for the wood to mature. Mulch in winter is good.

W. C. Flagg, Moro, Ill., said we find the injurious effects of the winter, or, as he preferred to state it, the effects of the last three years over much of the United States. Direct cold very seldom kills a healthy tree. Properly cultivated a healthy tree

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will generally be hardy. Peach trees have been known to endure a temperature of —30° for a short time. The climatic extremes of our country are so great that we cannot expect trees to be as long lived as in Europe. Death or injury to trees has resulted from several causes. In the latitude of St. Louis, in his vicinity, there was a great drought in 1870, extending through the winter and until February, 1872. There was an enormous crop of fruit in 1872, weakening the trees already partially exhausted by drought. In January, 1873, the most severe cold ever known in this region was experienced. This injured or killed the trees already injured. Trees in poor soil suffered more then those in better soils. The soil in that region is very finely comminuted. Further north it is coarser. In open soils the trees were killed more than on close soils. Plowing at the wrong time may do injury by exciting growth. Plowing early in the spring or late in the fall will not be injurious. An orchard too much protected may start growth prematurely. For several reasons its better to plant trees of one variety in blocks rather than in long rows.

Mr. Tuttle, in answer to a reference, said Dumelow's seedling trees came through the winter uninjured at Baraboo. The value of this apple is in it is excellence for cooking. It keeps well and holds its flavor well.

E. Wilcox of Trempealeau, said it was not hardy with him.

FIRE, OR LEAF BLIGHT.

Wm. Finlayson, Mazomanie, referred to the injury done in his vicinity by a worm which cuts off the branches (in a manner similar to the work of the oak pruner). He believed much of what is called fire blight, in his vicinity, is the work of this insect.

L. Woodard thought fire blight was caused by overheating the sap.

G. P. Peffer, Pewaukee, spoke of different kinds of blight. In cases where the blight appears first at end of branches and works downward, he rings the outside bark with a knife. This checks the return of the injured sap and stops the progress of the blight.

Messrs. Flagg, Tuttle and others continued the discussion, but the secretary was called away and failed to secure a report.

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H. M. Thompson, St. Francis, read the paper on Coniferous Trees and Tree Seeds; published on page 115.

Evening Session.

The Society met in joint session with the State Agricultural Convention, in the Assembly chamber, and listened to an address by Hon. W. C. Flagg, Moro, Ill., President Illinois State Farmers' Association and Secretary of the American Pomological Society, subject—Our Republican Democracy. At the conclusion of this address, President Stickney was called upon and made the following remarks:

Ladies and Gentlemen:—The horticultural fraternity as compared with the agricultural, is very small; but like most small people we feel quite large; and are impressed with the idea that we are favored with more than an average of the luxurious and beautiful; that ours is the music and poetry of life, while the labors and cares fall more heavily upon others. With our conceit and egotism, however, we also are large hearted and generous. So anxious are we that all should share our good things, that we keep constantly in the field a large force of *missionaries*, as we call them, but sometimes an unappreciative public call them *rascally tree peddlers*. These men are earnest and persistent, as doubtless many of you can testify, and if the choicest fruits and flowers do not abound, it cannot be their fault. Unfortunately, our homes and their surroundings are not such models of skillful planting and careful culture as they should be. This, however, is but another illustration that theory and practice may differ widely, and should be no excuse to him who would make the most of his rural home.

Seriously; our interests are much the same. We all depend upon mother earth for every good. We all need a better knowledge of the capabilities of the soil. To most fully develop the resources of our farms, to make our homes most beautiful and attractive, to interest and engage the largest possible number in these things, is work for us all to do, and work that in the doing, will increase our wealth and enlarge our minds and hearts. Let us each and every one seek to do this with all our might, mind and strength.

Thursday Morning Session.

The following papers were read in order:

G. P. Peffer, Pewaukee, on Forest Tree Culture—page 125.

G. J. Kellogg, Janesville, on Horticulture at Fairs—page 54.

J. M. Smith, Green Bay, Hints on Gardening and Fruit Growing—page 57.

Gen. N. F. Lund, Madison, Grape Culture by Amateurs—p. 86.

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GRAPE CULTURE.

The reading of Gen. Lund's paper was followed by many questions and discussion. He said he preferred covering the vines in winter with earth, then a little coarse litter. P. S. Bennett, Appleton, preferred a little straw next the vines, then covering with earth.

J. M. Smith spoke of the very fine display of grapes made each year at the Northern Wisconsin fairs, and of the success attending grape culture in the Fox river valley. One of his neighbors sold $100 worth of grapes from 100 vines.

G. E. Morrow said no one should expect to succeed as well as Gen. Lund unless he was willing to give daily personal attention to the vines.

General Lund preferred the horizontal arm and spur system even for vineyard culture. His experience was all in his garden. If he had sold the 700 pounds of grapes grown by him last year, his vines would have given him a profit. He grew them, however, for the use of himself and friends, and for the pleasure of the work. Grape growing should be engaged in by women. It is as fascinating as flower culture, and except covering and uncovering the vines, ladies can do all the work necessary as well as men and more quickly. He had grapes in his house in good condition at that time. Any good variety with a strong skin, can be kept well. In one case grapes were packed in boxes with dry oats, each cluster separate. They were in good condition when opened in April Diana, Isabella, Catawba, Rogers' No. 15 and Salem all keep well. The best plan he has practiced is to wrap the clusters separately in cotton, keep excluded from the air, in a cool place, near freezing point. He has the Eumelan. The growth is all that can be desired. The wood is very hard, and well matured, short jointed. The fruit is very fine.

F. S. Lawrence, Janesville, endorsed Gen. Lund's paper. His experience is similar. No one who can take no pleasure in grape growing should plant a vine. He does not like keeping grapes in cotton. He has kept them successfully in a cool, dry place, laid in shallow boxes, covered. In covering vines for winter, he uses straw or marsh hay, the latter the better. The covering is

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only designed to prevent alterations in the temperature. His soil is clay.

J. S. Harris saw Concords well kept packed in large boxes in dry sawdust. They lost the flavor of the sawdust when exposed to the air.

I. J. Hoile, Oshkosh, advised against use of sawdust; could not shake it from bunches without shaking berries off.

James Brainerd, Oshkosh, said he had grown grapes successfully for fifteen years. He covered the vines with straw, then with soil. He was formerly an enthusiastic admirer of the horizontal arm and spur system, but finally gave it up, as the vine would not grow as the books and pictures said they ought. He now trains according to the habit of growth of each variety. He can make more money in growing grapes than with any other fruit. An amateur in Oshkosh successfully keeps grapes packed in hard wood sawdust in barrels.

THE GRAPE LIST.

The list of varieties, recommended last year, being considered,

F. S. Lawrence, Janesville, said the list was as good as any one but he was opposed to recommending any variety.

P. S. Bennett, Appleton, thought the list about right, and moved its adoption.

Chas. Waters, of Vernon county has fruited the Janesville two years; finds it hardy, productive, long keeping.

Gen. Lund said the list was as safe as any that can be adopted. It furnishes sufficient variety for most cultivators.

James Brainerd, Oshkosh, heartily endorsed the list.

On motion, the Israella was added to the list, and the whole unanimously adopted. [The motion to add the Israella was afterwards reconsidered, and it was recommended for trial.] The list now stands:

General List.—Delaware, Concord, Lindley, Wilder, Salem, Agawam, Janesville, Worden, Eumelan. *For Trial.*—Israella.

RASPBERRIES.

The raspberry list being considered, Rev. P. S. Bennett recom-

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mended highly the Miami and Doolittle. He insisted that the Miami and "Mammoth Cluster" are distinct, slightly but perceptibly both in vine and berry.

President Stickney said there was no doubt Mr. Bennett had two varieties, but the Miami and the "Mammoth Cluster" are identical—so decided by the American Pomological Society. The latter name appeared in last year's list by mistake. It should not have been inserted.

On motion of I. J. Hoile, the name in list was corrected, and made Miami.

N. N. Palmer, Brodhead, said the Purple Cane was desirable with him.

President Stickney and others said it was not so productive and no better than the Philadelphia.

Messrs. Wilcox and Brainerd wished to add the Doolittle to the list. Mr. Brainerd thinks Davison's Thornless, from its earliness is profitable.

On motion of Mr. Bennett, the following list was adopted:

General List.—Philadelphia, Davison's Thornless, Doolittle, Miami.

On the recommendation of F. S. Lawrence and the President, in consideration of their fine quality, the following were recommended:

Fastollf and Brinkle's Orange, *if protected in winter.*

James Brainerd said the Hudson River Red Antwerp was good. The President agreed, but said several varieties were sold under this name.

Mr. Thompson, of St. Francis, said the Turner last winter seemed as hardy as the Philadelphia. It is productive, of good quality, but soft, and suckers much. The President said the few raised by him were of fine flavor. It suckers badly.

STRAWBERRIES.

The strawberry list being taken up, it was moved to continue Wilson's Albany and Green Prolific, which motion was adopted. Messrs. Greenman, Peffer, Hoile and the President, said that, when grown in alternate rows with the Wilson's Albany, Green Prolific was the more productive and better variety.

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J. M. Smith of Green Bay, found nothing profitable but Wilson's Albany. The Jucunda produces very fine berries, but there is no money in that variety with him.

F. S. Lawrence said Peak's Emperor is identical with Agriculturist. B. F. Adams said he considered the two varieties distinct. Peak's Emperor was originated at South Bend, and known before Agriculturist. Messrs. Greenman and Brainerd could see no difference in them.

A. G. Tuttle said the Arena (a seedling of Wilson's Albany, originated by Geo. Robbins, Mazomanie, Wis.), was best in flavor of any variety he knew. It is hardy and very productive. Mr. Barnes, Mazomanie, endorsed these statements. The President said he was much pleased with the flavor.

On motion, last year's list was continued as follows:

For General Culture.—Wilson's Albany, Green Prolific. *For Trial.*—Peak's Emperor, Charles Downing, Reed's Late Pine, Victoria, Burn's New Pine, Boyden's No. 30, Arena.

Thursday Afternoon.

ELECTION OF OFFICERS.

A motion to allow absent members to vote by proxy was lost.

An informal ballot was taken for each of the officers and as these resulted in nearly unanimous voting for the old officers they were declared formal and the entire list of officers for 1873 were elected for 1874.

President Stickney re-appointed the committees on Observation, Nomenclature and Seedlings, expressing the hope that at the next election a change of officers would be made, to make use of some of the new members of the society.

On motion of Mr. Finlayson, O. S. Willey was unanimously elected Superintendent of the Horticultural Department of the State Fair.

For complete list of officers and committees see opening pages of this volume.

The following papers were read in order:

O. S. Willey, Madison—Horticulture, What Is It—page 97.

F. S. Lawrence, Janesville—Ornamental Planting—page 50.

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Mrs. D. Huntley, Appleton—Flowers for Country Homes—page 36.

Mrs. H. M. Lewis, Madison—Adornment of Home—page 42.

Rev. P. S. Bennett, Appleton—Small Fruits—page 81.

HARDY STOCKS.

E. Wilcox, Trempealeau, offered the following:

WHEREAS, The wide spread and great destruction of apple trees from root killing during the last winter, has demonstrated the necessity of using more hardy roots to graft upon; therefore,

Resolved, That we condemn the use of roots obtained from seeds sown indiscriminately, without regard to the kind of apple that produced them.

The resolution being under consideration,

Mr. Wilcox said: I have attempted to raise an orchard. I was taught it was unsafe to buy of tree peddlers, and bought of established nurserymen. I have no complaints to make when the trees were good when received. I had a good orchard; but it is gone. Last winter killed the trees, and we are now burning apple wood for fuel. I believe eastern trees, of tender varieties, are unsafe. We have been getting apple seeds from the east and grafting "iron clads" on the stocks grown from them. In this way we get tender varieties for our stocks. Shall we go on? The injury to most trees was in the roots. In some cases we find trees living when the roots have started from the hardy cion. My plan for the future is to plant seeds of crabs or of hard varieties; graft the Transcendent on the roots thus produced; at two or three years old form a good top and graft the desired varieties into the Transcendent branches.

Vice President Tuttle said he had lost many young trees, rarely old trees of hardy varieties. He had failed in top working on crabs. The Transcendent forms an imperfect union even with slow growing trees. Perfectly hardy varieties, those proven so by long continued tests, should be planted. We cannot test a tree in a few years. The Northern Spy has been highly commended, and does stand well when young, but dies after fifteen years. The injury to roots is mostly in sandy soils. Such soils freeze much harder than clay soils. Drought has some influence. He is in favor of experimenting with crab roots. Even

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where it is difficult to grow the common apples, sufficient mulching and protection will save the roots.

E. Wilcox. Is it true or not that like produces like? Will tender seeds produce tender varieties?

G. P. Peffer. It is only partially true.

E. Wilcox said he had invariably mulched his trees with earth. The injury was not confined to any particular kind of soils or any particular kind of culture. His trees were under various condition, but the drought and cold together killed them. Even under the unfavorable circumstances the seedling crabs came through.

G. P. Peffer said a tubful of water to each tree in fall would have saved them.

L. Woodard said we cannot depend on raising the same variety from the seeds. When we have had sufficient moisture our trees have generally been saved.

P. A. Jewell, Lake City, Minn., said he could not agree that the only hope of our pomology is in crab roots. No variety of apple or crab is exempt from root killing. We must either set our trees so deep that they will root from the cion; or use crab seedlings for stocks; or depend on mulching. He preferred the first plan. It is reasonable that a tree on its own roots will not be injured in roots sooner than in the top. Crab seedlings differ in hardiness. To send out trees with crab roots as absolutely hardy will make planters careless. He had tested seedlings of the Siberians that were not as hardy as Fameuse. The union between the crab and other trees is not good. One crab grafted on another does not always produce a good union. In mulching, nothing is so good as straw or prairie hay. One or two inches of snow is better than a foot of earth. Falling on the straw or hay the snow is retained.

Vice President Tuttle said he had grafted 10,000 Transcendents with Tetofski and other varieties; but 500 perfect unions were formed. In many cases it was so imperfect that early fruiting was induced. The Brier's Sweet Crab formed perfect union on Transcendent stock.

Wm. Finlayson said he planted several thousand crab seeds; the stock all killed last winter.

President Stickney said he introduced this subject to the so-

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ciety several years ago. In all he had grafted 100,000 trees on crab roots, during four years, and has abandoned the plan except when he wishes to produce a dwarf tree. Not more than 60,000 lived, and not more than 20,000 made good trees. The union is not good. In eighty per cent. of the cases the tendency will be to produce a dwarf tree.

G. J. Kellogg said most of those present had tried crab root grafting. His experience was that it could not be depended on.

E. Wilcox said the resolution did not confine us to crab roots; it included hardy varieties.

Vice President Tuttle said he was experimenting in this matter. He had a peck of Tetofski seed, a peck of Fameuse seed, and would keep the stock separate.

G. P. Peffer said he had used crab seed and seed of his own raising for years. Many crab seedlings have proved tender.

M. A. Holt, Madison, said a hardy root is pure white; a tender root or one that has been injured will show color. If a root is affected in any manner, the tree grafted on it will be injured. We should be careful to use only perfectly sound roots in grafting.

The question on the adoption of the resolution was then put, and it was declared lost, the vote being almost unanimous.

The committee appointed to examine fruits on exhibition, submitted a report, for which see subsequent pages.

G. J. Kellogg offered the following resolution:

Resolved, That this society lend a helping hand to the horticultural department of the fairs of the Northern Wisconsin Agricultural and Mechanical Association.

The resolution was unanimously adopted, after some remarks complimentary to the exhibitions referred to.

Thursday Evening.

The committee on premium list reported the changes they had made. On motion of G. E. Morrow the list was re-referred to the committee, to which President Stickney was added, with power to make such changes as seemed proper.

THE APPLE LISTS.

President Stickney called on P. A. Jewell, Lake City, Minn.,

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who said that Tetofski and Duchess of Oldenburg stood best in Minnesota. The Peach apple stood next best. This is of value only in exceptional localities. Of Minnesota seedlings, the Wealthy is the only one that is doing well. This is doing nearly as well as the Duchess. The original tree is twelve or fifteen years old. The apple is large, handsome and of fine quality; keeps until January. Saxton and Price's Sweet were recommended by Minnesota Society, among others, for trial. Golden and Perry Russet and Red Astrachan were rejected, because not entirely hardy and tardy bearers. Golden Russet blights very badly. Walbridge has stood well and is promising. The Haas stood well—there are few old trees of this variety in the state. The Famuese increases in hardiness as it advances in age. The older trees were not seriously injured. The Pewaukee may be one of the varieties which grows hardier with age. Young trees and nursery stock of this variety killed badly with him; much worse than Walbridge by their side. Minnesoteans have not found *the* late keeping winter apple yet. Plumb's Cider did not stand in nursery as well as Walbridge or Haas, but in orchard is one of hardiest varieties. He has but one Flemish Beauty pear tree. It stood at north end of row of crab trees. He cultivates all trees well.

G. P. Peffer explained that the Pewaukee trees spoken of had a very rapid growth. He had found some young trees of this variety in good condition in Minnesota. Fire blight had affected the original Wealthy tree badly.

E. H. Benton, Le Roy, spoke of the importance of early bearing. If we have a tree which will bear in five years from the graft, it is a great help. We can better afford to lose a tree of this kind. Some varieties he would continue to plant if he knew they would fail after a few years.

Vice President Tuttle said it is a great loss to lose a tree, even when it has borne some. He wants a tree that is hardy when old. It is little loss to lose a young tree compared with the loss of one in full bearing. It is of much less importance to have trees hardy in the nursery than to have them hardy in the orchard. The Pewaukee grows very rank in the nursery, but he has full confidence in it as an orchard tree. He moved that a list of five varieties

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with hardiness the only test be made; which motion was adopted. As such list he suggested Tetofski, Duchess of Oldenburg, Haas, Plumb's Cider, Alexander.

Tetofski, Duchess and Haas were unanimously placed on the list.

Information was asked concerning Plumb's Cider.

Charles Waters, of Vernon county, says it stands as well as any tree in orchard.

Wm. Finlayson, Mazomanie, thought it hardy, but not profitable.

Mr. Tuttle, Baraboo, said it is one of the best of bearers and a very desirable tree; will not keep quite as well as Fameuse.

President Stickney said he had 20 trees, four years planted, seven years from graft, that had all borne.

E. Wilcox, Trempealeau, said it was among the best in that region.

Mr. Waterbury, Prairie du Sac, said it was one of his best bearing trees.

It was unanimously adopted.

Of the Alexander, Mr. Tuttle said it was perfectly hardy, as all the Russian varieties are. It was not a very desirable variety, but with hardiness as the test, it should go in.

L. Woodard said it ranked with Red Astrachan in hardiness.

On vote, the Alexander was rejected.

On motion, Famuese was placed on the list by unanimous vote.

Several gentlemen bore testimony to the great value of the Famuese, and to its having better keeping qualities than are usually credited to it. Mr. Tuttle has no difficulty in keeping it until March 1.

It was moved to extend the list and add Walbridge. Mr. Kellogg wanted information as to its hardiness. He thought it no more hardy than some other varieties. Mr. Seymour, Mazomanie, had some trees killed in nursery; not as hardy there as Alexander. Mr. Innis, of Fond du Lac county, said his trees of this variety were uninjured. L. Woodard said injury in a few places is not sufficient proof of lack of hardiness. The Ben Davis had injured in some places last winter. It may not for 20 years again. P. A. Jewell, of Minnesota, said the Walbridge stood better in

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nursery than the Red Astrachan, and as well as the Alexander, much better than the Ben Davis. C. H. Greenman said there are 25 or 30 trees in Rock county, Wisconsin, which are 25 or more years old, and none of them have ever been killed. They are in full bearing and highly prized.

It were decided to leave the list with only five varieties.

For the list for General Cultivation, the five already selected was adopted, and Walbridge, Red Astrachan and Utter.

Of the Utter, Mr. Tuttle spoke favorably, although it is liable to injury by bark bursting. E. Wilcox said it stood as well as Famuese. Mr. Peffer said it stood as well as any other.

Westfield Seek-no-farther was proposed. Charles Waters, of Vernon county, had not found it hardy. Messrs. Hoile and Bennett said it did well in the northeastern portion of the state. Mr. Benton said it was growing in favor in Dodge county. Mr. Tuttle found it do well with him. Mr. Harris, Le Crescent, Minn., said it was hardy with him. It was adopted.

Ben Davis was proposed.

Vice President Tuttle said he had always claimed that this variety was not fully tested for Wisconsin. The society made a great mistake and did much harm by recommending it last year. In Iowa it killed badly in orchards, although it stood well in nursery. The same was true in Michigan as he learned from T. T. Lyon. It succeeds well in nursery but is not hardy older. Some of the hardiest trees in nursery kill in orchards; some trees not fully hardy in nurseries prove hardy when older.

Charles Waters said it did not do well with him. Has 30,000 or 40,000 nice trees in nursery, but bearing trees were badly injured.

C. H. Greenman said young trees killed with him.

Mr. Butler, Sparta, said bearing trees all killed there last year, but the winter was exceptionally severe.

P. A. Jewell, Minnesota, said more Ben Davis trees have been sold in Minnesota of late years than of any other variety. The society regrets recommending it. The older the trees the worse it is killed.

E. Wilcox said it is a worthless tree.

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P. S. Bennett said a tree with such a reputation as this has had can hardly be worthless.

G. J. Kellogg, Janesville, knows of trees in Rock county, top-worked and doing well. He would not reject it. He believes it adapted to general cultivation in southern and eastern parts of the state. W. Finlayson, Mazomanie, said no tree does better in nursery. He has but one tree in bearing; that is a model of health. He knows of it doing well in other places in Dane county. L. Woodard, Marengo, Ill., said the Illinois society once refused to recommend the Duchess of Oldenburg, but it would succeed. He believed this would be true of the Ben Davis. It is second-rate in quality, but a great bearer, and a good market apple. It is the most valuable apple in Illinois, and he believes it will continue to be planted in Wisconsin, especially in eastern part of the state.

On a vote, taken by rising, the Ben Davis was placed on the list—10 to 7; many present not voting.

The following were placed on this list without discussion: Talman Sweet, St. Lawrence, Willow Twig and Pewaukee.

For fruit lists as adopted, in full, see opening pages of this volume.

It was resolved to have the first session of the next annual meeting held on Monday evening, February 1, 1875.

A resolution of thanks to Chicago and Northwestern and Milwaukee and St. Paul Railway Companies for reduced fare to members attending the meeting, was unanimously adopted.

The session having been protracted to a late hour, President Stickney, on motion, declared the annual meeting of the State Horticultural Society finally adjourned.

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FRUIT EXHIBITION AT ANNUAL MEETING, 1874.

REPORT OF COMMITTEE.

Your committee on Examination of Fruits begs leave to report the following exhibitions of fruit, etc.:

George P. Peffer, Pewaukee, exhibits sixty varieties of apples, including many seedlings, of which the Pewaukee, Clark's Orange, and Peffer's winter, maintain fully their former places as given by this Society Among those shown there are fine specimens of Ben Davis, Alexander, Plumb's Cider and Colvert. All varieties are well kept. The wood exhibited of the Pewaukee and Ackerman is sound. That of Clark's Orange, Lyman and Large Yellow is in good condition.

J. S. Stickney, Wauwatosa, exhibits fine specimens of Weaver's Sweet, Minkler and Lady Apple.

H. M. Thompson, St. Francis, exhibits thirteen seedling varieties; very fine in appearance and of good size; also exhibits the wood of five varieties which is all sound. Of the varieties named the Sidney is of good flavor; No. 1., good cooking; Black River, good; Valere, all right.

A. Sherman, Janesville, shows three varieties—Paradise Winter Sweet, good; Fall Orange, small; one variety, name unknown, of good flavor.

J. C. Plumb, Milton, exhibits Lake Crab, rather small past maturity; Paradise Winter Sweet, large, flavor medium; two Winter Apples for name; size, medium; No. 1, juicy, firm flesh, best for cider; recommended for cultivation; No. 2, hard, dry, third rate.

F. S. Lawrence, Janesville, exhibits three varieties, Fameuse, very good specimens, well kept. Seedling, large, yellow, begun to decay; seems worthy of trial. Rhode Island Greening, good size, in good condition.

A. G. Tuttle, Baraboo, exhibits four varieties, Tetofski, Fameuse, Duchess and Dumelow; very fine specimens and well kept.

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Edwin Nye, Freedom, Outagamie county, exhibits five specimens. One seedling thirteen years from seed, has borne four years in succession, last crop nearly one barrel, named Pioneer, small, rather insipid; three seedlings rather small, one quite good flavor; one seedling, flavor second, size small.

Charles Hirschinger, Baraboo, Wis., exhibits Weaver Sweet, large, fine specimens, perfectly kept.

E. H. Benton, Le Roy, Dodge county, exhibits one sedling of sprightly flavor, good for cooking; has borne seven years in succession from one to two and one-half barrels; fall and early winter; tree perfectly hardy.

C. H. Greenman, Milton, exhibits five pound grape basket of good design, well made. He puts eight baskets in a case for transportation. Also fine specimens of the Walbridge, rather small, flavor second, long keeper, recommended for cultivation.

J. W. Emmons, Magnolia, exhibits can of Black Morello cherries, put up three years since, in perfect condition, quite tart, good for cooking.

Peter Schmidt, Janesville, exhibits seedling, deficient in flavor.

Geo. J. Kellogg, Janesville, exhibits R. I. Greening, Swaar, Baldwin, all in good condition.

E. H. BENTON, Wis.
P. A. JEWELL, Minn.
L. WOODARD, Ill.

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REPORTS ON OBSERVATIONS.

REPORT AND CORRESPONDENCE BY I. J. HOILE, OSHKOSH.

In endeavoring to perform my part of the duties assigned to your "Committee on Observation," my attention has been directed chiefly to the extent of the injury done to fruit trees, grape vines, etc., by the drought and heat of 1872, and the intense cold of the following winter; and to ascertain, as far as practicable, the varieties that best endured the almost unprecedented test to which all alike were subjected, and hence established their right to be designated as "iron clads."

With this object in view, I, during the summer, visited a number of orchards in Winnebago and neighboring counties, and at the same time and during the year sought information by correspondence with fruit growers, whom time and business engagements prevented me from visiting, intending to embody the results of these observations and inquiries in a condensed report. It subsequently occurred to me, however, that the interests of our society, as also its objects and aims, would be promoted by securing a few brief reports from gentlemen of known practical experience, some of whose orchards, etc., I had visited, to be submitted to you with my own.

It affords me much pleasure to inform you that I succeeded in obtaining four such reports, and in looking them over, and especially in comparing those of Mr. Edmund Chase, of Omro, and Mr. R. J. Harney, of Oshkosh, with my own notes of observation and inquiry, I found that they so nearly agreed therewith, and that my own views as deduced therefrom, relative to the real causes of the late injury, and the precautions advisable against a

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recurrence of the same, were so fully embodied in the communication of the latter gentleman, and is so much more succinctly expressed than I could hope to do, in order to convey the same ideas, as to render it altogether unnecessary, and therefore unadvisable to occupy time or space by presenting any further report of my own.

I will, therefore, with your permission, read those referred to, simply stating, for your information, that Dr. Chas. Lynde is the oldest physician in Oshkosh, and at least one of the oldest and most thoroughly practical amateur vineyardists in the state. His vineyard and fruit grounds are surrounded on the north, east and west by a high and tight board fence, his residence and out buildings occupying almost the entire frontage on the south of his vineyard, and the complete protection thus afforded to his vines will account for his not covering in the winter, and with the exception referred to, he has almost invariably, for many years in succession, raised abundant crops of finely developed fruit. Mr. Topping is connected with the nurseries of E. H. Skinner & Co., of Rockford, Ill., but has operated chiefly, I believe, in this state. Messrs. E. Chase and R. J. Harney have for many years been prominently identified with the interests of horticulture in Winnebago county, and although their names, I believe, have not heretofore been associated with the proceedings of this society, yet I take it for granted that you will hail with pleasure their addition to our ranks as practical correspondents.

I. J. HOILE.

REPORT BY R. J. HARNEY, OSHKOSH.

On the request of Mr. I. J. Hoile, of the "Committee of Observation," I herewith transmit a few remarks on the manner in which fruit trees and grape vines were affected in this part of the state by the drouth and heat of the summer of 1872, and the severity of the following winter.

My observations have been confined principally to the eastern

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part of Winnebago county. In this locality a large percentage of the half-hardy varieties were injured beyond recovery; quite a portion of them being killed. Even our hardy varieties were more or less injured; but, among these, the Fameuse, Ben Davis, Westfield Seek-no-Further, Red Astrachan, and Duchess of Oldenburg seem to have maintained their pre-eminence for hardiness. For, although a portion of those varieties were badly injured, and in a few instances totally destroyed, much the larger portion survived the severe test with comparatively little injury, the annual growth being only slightly discolored, and this to a great extent disappeared last season, the trees making a fair growth, with good foliage, and the bark showing no signs of disease. The crop of fruit was small, but of usual quality, and the trees give promise of recovering their full vitality and fruitfulness the coming season.

In orchards situated in the most favorable localities, and the trees of which had received good culture, the injury to hardy varieties was very slight. This is especially the case on good rolling ground with gravelly, limestone subsoil, retentive of moisture. In one such orchard, out of fifteen Fameuse, only two trees were badly injured. Among twelve Seek-no-Further, only three trees. In another, out of nine Fameuse, one only was badly affected, the other hardy varieties suffering in somewhat greater proportions. In some unfavorable situations where the soil had dried out to a depth of two or three feet, and where trees had been neglected, the destruction was most thorough, including all varieties, the injury being beyond recuperation.

What precautions are practical to guard against the effects of a recurrence of the same causes? To meet this question, it must be first ascertained whether it was the heat and drouth of the summer or the low temperature of the winter, that was chiefly instrumental in the injury done to fruit trees, or how far it may be attributable to both. This will necessitate critical observations in various localities. I will therefore in this connection contribute mine.

In the well sheltered localities where the ground was well underdrained, either by artificial drainage, or the better one of natural drainage, and where the trees had received good culture

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the injury to the hardy varieties was very slight. In a number of gardens in this city, containing from twenty to forty apple trees, and Flemish Beauty pear trees, not over one in ten is badly hurt. In one garden containing eight bearing Flemish Beauty pear trees, not one was materially injured. The soil of those is a good loose clay loam with more or less disintegrated limestone in the subsoil, making a soil retentive of moisture. In other gardens with a hard soil which was baked dry as a bone, when winter set in, the destruction of the trees was complete. The same marked difference is observable in the country. It is also an observable fact, that the surface roots of a great many trees whose trunks and branches, gave little indication of injury, were totally destroyed, by being frozen dry, in the dry earth. A large percentage of grape vines were killed outright; and an examination of the roots, showed conclusively that the frequent freezings and thawings in the dry ground, had extracted all moisture.

The excessive drouth of the summer deprived the trees of their necessary moisture. The long process of evaporation exhausted the supply; and the vital forces of the trees were thereby impaired. In this weakened condition winter set in upon them, in its greatest severity, without its usual preceding rains, and while roots were frozen in a dry soil which was extracting their moisture, the incessant and drying winds were performing the same operation on their branches.

The atmosphere of this state is characterized by excessive dryness and clearness, favoring a very rapid process of evaporation; and the belief is suggested that it is the winter evaporation, when the soil is too dry to afford the necessary moisture, in addition to the drouth, and heat and drying winds of summer, rather than the low temperature of winter, that lays at the foundation of the climatic injuries of our fruit trees.

This conclusion seems to be sustained by the fact that countries lying east of our large bodies of water are more favorable for fruit growing, than those west of them, from the prevalence of west winds. These are dry winds in their whole passage across our state, but on reaching lake Michigan they absorb their fill of moisture from its waters, and consequently do not have so drying

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an effect on the state of Michigan, which is the paradise of western fruit growing.

The suggestion will here arise that it is the reduction of the coldness of the air in its passage over this body of water, that produces the beneficial effects. The temperature is undoubtedly raised many degrees in winter and lowered in summer, with salutary results in both seasons; but the power of aqueous absorption is also lessened to a greater degree, especially in the summer, and consequently does not, to a corresponding extent, deprive the country of moisture.

Our peculiar climatic conditions would then seem to indicate the necessity of a culture wisely adapted to them, and one widely different from that of Michigan or New York. Such a culture would first embrace the necessity of close planting, by which the trees when large enough to bear, would shade the ground from the too intense heat and light of the direct rays of the sun. For apple trees, say about eighteen feet apart. This proximity to each other would also be a mutual protection from the force of high winds, an impediment to the rapid movement of the air, and a check upon rapid evaporation; shelter by belts of timber, or a young growth even that would keep pace with the growth of the orchard; heavy mulching for some distance beyond the extension of the roots, and when the trees come into bearing, the whole surface of the ground to be kept covered with straw and enough stable litter to keep the straw in its place. This would serve to protect the ground from excessive light and heat; would keep it at a more even temperature, prevent a too rapid evaporation and make it retentive of sufficient moisture.

This would be some approximation to nature's method of tree-growing. She gives us hints of her processes which might intelligently guide our efforts. She grows her trees in forests where the ground is canopied by leaves and branches, through the instertices of which the rays of light pass with subdued brilliancy. The movement of the air is also impeded by the density of the forest. The falling leaves and decaying trees are her mulch, which also protect the ground and surface roots from the heat of the sun, and which aid in the retention of moisture. The leaves are exposed to the air and the light for the purpose of absorbing gases and for

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the liberation of the oxygen exhaled by all vegetable life, and for the separation of the carbon from the oxygen absorbed by the tree in the form of carbonic acid gas.

The prevailing moisture of the ground and dampness of the air in forests, are also favorable conditions for the decay of the vegetable matter, which produces the carbon for the formation of wood fiber, and to hold in store this necessary food for vegetable life.

Now while our highly improved fruit trees, with their prolific qualities, need higher culture and richer substance, necessitating a modification of nature's method, still if the departure goes so far as to violate the fundamental principles, the results must be weakened vitality and consequent disease.

When young apple trees, first coming into bearing, stand at a distance of two rods apart, which has been the usual distance of planting, they are exposed on all sides to the drying winds, to the continual glare and heat of the sun, and the heat reflected from the exposed earth. The attention, therefore, of Horticulturists in this state cannot be too urgently called to the importance of having the ground partly shaded; light and air for the leaves; shade for branches and trunk; shade and moisture for the ground, and protection from too much heat for the roots.

All, of any experience, must have observed that the habit of our hardiest varieties is a horizontal and drooping growth of branches, by which they shade their trunks and the ground covering their roots from a too strong light and heat, and of which the Fameuse is a striking example.

REPORT OF EDWARD CHASE, OMRO.

I have an orchard of about six hundred trees situated 1-2 mile south of lake Buttes des Morte on a ridge of land elevated about two hundred feet above the lake, with a north and west exposure, with no wind brake of any sort. The trees are 16 1-2 apart each way. The soil is a sandy loam underlaid with a clay subsoil, mixed with limestone gravel. The trees are mostly very short

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bodies with a few tall trees in different parts of the orchard by way of experiment. Nine-tenths of the whole are grafted or budded in the limbs, a few stock grafts, and some root grafts. I have 124 different kinds of grafted fruit, selected indiscriminately for experiment.

I find but very few but do best worked in the tops. I prefer budding to grafting if done in limbs not above 3-4 of an inch thick. I have been more unlucky with root grafting than any other way. A few years since when trees burst their back near the ground in all parts of the state, I lost ten or twelve in that way, and all among my root grafts, with no apparent reason from any external appearance why it should be so. Considering the number of trees and their exposed situation I was very fortunate last winter. I had but three killed outright, but many injured, among them some of the so called "Iron Clads." Two of the trees killed were stock grafted—Gravenstein, and one Baldwin. Many varieties usually considered tender, like the Rhode Island Greening, White Janeting, Belmont, Early Harvest, Fall Pippin, Maiden Blush, High-top Sweeting, and several others, when top grafted, stand the winter well.

Among the varieties injured more or less, were the Baldwin, Northern Spy, Talman Sweet, Perry Russet, Rambo, Golden Russet, Pound Sweeting, Utter, Yellow Bellflower, Fall Winesap, Colvert and Gravenstien.

Among the varieties that survived the winter without apparent injury, were first, the Mountain Sweeting, a new variety in these parts, but one remove from the original tree, as I obtained the cions a few years since from the original tree, now over eighty years old, which I saw in bearing two years since. It bore a heavy crop last season of excellent quality; second, the Blue Pearmain passed the winter without injury and bore a good crop last season. Third, the Pomme Grise, Honey Sweeting, Woodstock Belle, Black Apple, American Golden Russet, Westfield Seek-no-Further, Hart Bough, Red Astrachan, Roxbury Russet, Fameuse and Dutchess of Oldenburgh. Many others that were top worked came out but little injured, while many of those root or stock grafted were somewhat injured.

I have four varieties of cherries that stood last winter with but

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little injury. The Early Richmond and May Duke burst their bark some, but made a good growth and bore a few cherries. The Late Duke and Reine Hortense were but slightly injured.

My plums are almost an entire failure.

REPORT OF N. H. TOPPING.

I found in Shawano, Outagamie, Waupaca and Brown counties, English Golden Russet, Rawle's Janet, Milam, Talman Sweet, Pewaukee, Duchess of Oldenburg, sound, old or young. Ben Davis, Winesap, Northern Spy, Dominie, Colvert, Perry Russet, Walbridge, Jonathan, Fall Orange, Fameuse, Price's Sweet, Red Astrachan, will still be planted. They are some injured, but not badly. Saw one man who had four Ben Davis fourteen years planted, who said if he had planted one thousand then, he could have bought a farm with the fruit, for there were dollars and cents in them. Transcendent Crab, first class; Hyslop, good. Early Richmond cherry and English Morrello are the best.

The kinds of apples that I have given you have many friends, and I wish every western nurseryman would put his heel squarely upon growing only those varieties known to be hardy. Then when the order was given, parties would not need to get a few to test their hardihood, but would be sure that those they received were all acclimated, and would meet their expectations. Then the doleful cry, "can't grow fruit in the west," would no longer greet us.

REPORT OF DR. CHAS. LYNDE, OSHKOSH.

All my Rebeccas and Eumelan grapes are dead, and some of Rogers' Hybrids. Clinton, Delaware, Hartford Prolific, Diana and Concord are all right. I do not cover in the winter, but pin the vines down.

All my apple trees suffered more or less, except Talman Sweet

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and Duchess of Oldenburg. All my Flemish Beauty pears are dead. My plums all suffered; all the Green Gages are dead. My vines seemed to suffer more on high and dry land than where the ground was moist.

REPORT BY A. L. HATCH, ITHACA, RICHLAND CO.

Tetofski and Duchess of Oldenburg.—Hardiest and earliest bearing of any large apple we have tested. Trees in orchard and nursery sound and good where Fameuse, Golden Russet, etc., have failed from winter killing.

Haas.—Very rank grower; very hardy; grows too late, still no trees in our nurseries that had grown as much were brighter last spring.

Talman Sweet.—For bark bursting, give us the Talman. Almost discouraged with it in our nurseries on that account. On good strong soils, if it succeeds, it is very productive.

McMahan's White.—Originated in this county. Tested three years by us. Endured last winter as well as Duchess. Fruit large and fine; December or later. Promises first rate.

Sylvan Sweet Crab.—One of our pets. Fruit from two to two and a half inches in diameter; real sweet and free from astringency of common crabs. Original tree in this county eleven years old, without a blemish in trunk or limb.

Canada Peach.—Tested three or four years. Fine, tapering growth of limbs, hardy as Tetofski so far. We obtained it from Canada, and regard it as very hardy and want more of them.

Pewaukee.—Poor Pewaukee! Last winter, slaughtered what did not go the winter before. With us it has not proven as hardy as Fameuse or Golden Russet.

Seedless Peach Crab.—Originated in Sauk county; larger than Transcendent; season, December to February; better than Hislop. Think very highly of this crab.

Mammoth Cluster Raspberry.—One of our best black caps; superior with us to Doolittle in size, yield and bush. Can see no difference between this and Miami; both hardy on clay soil, and both excellent.

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Davison's Thornless Black Cap.—Earliest black cap raspberry we have, and best quality. Think better of it than we once did; like it well if given good culture.

Clarke Raspberry.—Best quality, largest and one of the most productive red berries we have fruited. If as hardy as Purple Cane, we would concede it best of all. On clay soil and good sites may not need winter protection.

Green Prolific Strawberry.—Give it not too rich soil and we regard it best of a dozen sorts tested by us. Will not thrive as well as Wilson on rich soil.

FRUIT SOILS.—Root killing and winter killing occurred most freely on sandy soils last winter, excepting perhaps on muck soils with wet, cold subsoil, where almost everything suffered in the tops. On ridge land elevated 500 or 600 feet above the valley near us, Golden Russets, two years old, were uninjured last winter; they grew almost to the terminal bud. Soil light, clay loam, formerly covered with white oak brush. Fire blight has occurred very freely during the last season on sandy soils and warm, quick growing sites.

January 29th, mercury congealed. February 2d, mercury 36°; February 7th, 39°; "warmest day for nearly three months." (Diary.)

May 21st, apple trees just beginning to bloom. July and August, drouth! drouth!

If anything is shown by last years experience and disasters, it is the utility of mulching. The great want of our summers is not so much heat as it is moisture at the proper season. Thorough and timely mulch will secure it, and at the same time secure protection against root killing. Trees froze dry, and even the hardiest varieties were occasionally root-killed. Another thing very plainly shown is, that many of the general recommendations of leading Horticultural authorities need radical modification to be practical—especially what to plant.

The secretary of the society suggested, as an aid in giving information, that the following questions be answered:

1. What varieties of apple trees passed through last winter uninjured?

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2. What was soil, aspect and cultivation?
3. What varieties hitherto considered hardy, failed?
4. In what way was injury first manifested?

C. H. Greenman, Milton, writes that trees stood best on northern aspect, with clay soil; that Fameuse, Talman Sweet and Fall Orange failed in sandy soil; that injury was first shown by feeble growth, and in evidence of injury to roots.

G. P. Peffer, Pewaukee, writes that only three varieties in list recommended last year, were much injured. Those were Talman Sweet, Ben Davis, Westfield Seek-no-Further—and Fall Stripe, to some extent. The injury was caused by root killing in December and intense cold.

REPORT OF CHAS. HIRSCHINGER, BARABOO.

My list will necessarily be longer of those that have passed the winter without injury than I would be willing to recommend to the planters of Wisconsin, as my orchard and nursery are located in the timber, well protected on all sides by a heavy belt of timber.

The following varieties are esteemed hardy in the order named: Duchess of Oldenburg, Tetofski, Haas, Plumb's Cider, Walbridge, Fameuse, St. Lawrence, Weaver Sweet, Utter's Red, Fall Orange, Red Astrachan, Golden Russet, Perry Russet, Colvert, Summer Bellflower, Bailey Sweet, Alexander, Early Joe, Saxton, Westfield Seek-no-Further; also, several unknown varieties, and, contrary to former experience, the Falawalder, Pomme Grise and White Winter Pearmain have passed the trying winter without injury. The Siberians are all right, except one Transcendent, ten years old, which was root killed.

A northern slope, with clay soil, is best. About half my orchard is in grass, the balance is under cultivation, and has been for ten years.

The following have not exactly failed, but are injured more or less: Sops of Wine, Lowell, Rawle's Janet, Autumn Strawberry, Red Romanite, Northern Spy, Maiden's Blush, Sweet Pear, Sweet Wine. The Wells' Sweet and Early Harvest have failed—killed

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in the top. The Northern Spy in grass are all right, while of those under cultivation I have lost half—killed root and branch. The trees were full of bloom, but in a few days the blossoms died, the leaves withered, and, with a few exceptions of the last named, died, root and branch.

More trees died in cultivated ground than in grass, but this does not convince me that young orchards should be sown to grass for at least four or five years. We may as well kill them by cultivation as to stunt them for life, which is almost always the case where planted in grass.

I have not mentioned some varieties that have been favorably spoken of and looked to with considerable interest. I have not tested them long enough to speak understandingly. Of Pewaukee I have twelve trees planted two years. All have stood the severity of 30° below zero uninjured. I think the Pewaukee is safe for me to plant.

The Ben Davis, Willow Twig, Grimes' Golden Pippin and Stark, show signs of tenderness in the nursery. Willow Twig in the orchard has stood well.

Of Seedlings, I have about fifty in my orchard; two thirds of them have been injured more or less. After puttering with seedlings for twenty-four years, I propose to quit the business, so far as making an orchard of them is concerned. I never know what kind of apples they will bear, and I have found them, generally speaking, less hardy than trees grafted of the more hardy sorts.

After testing over 100 different varieties, and living in Sauk county over twenty-six years, I have learned there is more money to be made in orcharding by planting say twenty varieties of the leading sorts than 100 varieties, and for commercial list ten kinds is sufficient.

Let me give you one instance of an orchard planted four years; located in the timber on the best of soil; highly manured every year; trees of the leading varieties, Duchess not excepted; trees very thrifty and nice; pruned every year; tops kept open by pruning, causing the sap to concentrate on the remaining branches; cultivation till fall. Result: not a dozen trees left out of 200 or 300. They top killed. The bark looked like a frozen potato. Too high cultivation wont do.

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REPORT OF E. W. DANIELS, AURORAVILLE.

No one variety entirely escaped in this vicinity. In some orchards (not mine) one-eighth or 12 per cent. killed. Duchess of Oldenburg 12 per cent.; Fall Wine Sap 25 per cent.; Snow 5 per cent.; Fall Orange 5 per cent.; Perry Russet 5 per cent.; Golden Russet 2 per cent.; Talman Sweet and St. Lawrence injured at the end of the limbs; Rambo's gradually every year; Red Astrachan 5 per cent.; Pommegris 0 per cent.; Northern Spies like Talmans; Saxton or Fall Stripe 0 per cent. Crabs all right, except blight.

Nursery stock one year old, some varieties all killed, others at the tops. Talmans entirely, Golden Russet nearly, and all other leading varieties from one to two-thirds killed and all made a feeble growth the past season. The 2 and 3 year old trees killed but little, Northern Spy the most. Ben Davis, Snow, Bailey Sweet, Early Harvest, Fall Wine Sap, St. Lawrence, bleached more or less.

The varieties that stood without injury were Duchess of Oldenburg, Perry Russet, Talman Sweet, Walbridge, Sweet Pear, Fall Orange, Haas, Utter's Red, Plumb's Cider, Tetofski, Red Astrachan Sops of Wine, and a good number of varieties of extra seedlings I am testing, and all the crabs.

Flemish Beauty Pear did not winter kill, but blighted badly for two years past.

REPORT OF J. McCREEDY, OAK CREEK, MILWAUKEE COUNTY.

I have 150 apple trees planted on stiff clay soil, with northeastern slope, protected on the east and southeast by a belt of timber, on the west by rising ground, the farm buildings and ornamental trees. The first plantation was made in 1844, of seedlings, two

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rods apart each way. In 1849, I think, I got some trees from Rochester, New York, and planted them upon the same ground, making the rows two rods apart east and west, and one rod north and south, which is too near; the branches interlace. My orchard has been cultivated, except during the war and the last two years, it is now in clover. I propose to mulch it well and try it that way for a few years. I have one tree, a seedling, of fourteen inches diameter, and several that can show twelve inches of good sound wood.

I have grafted many seedlings since they came into bearing. I have always pruned in March and April; have lost but few trees, and last winter but one—a Sweet Bough about seven years old. The Lowell has paid me the best of any variety I have. The codling moth does me great injury, and I should like to pay her in kind next spring.

My list of varieties is: Lowell, R. I. Greening, Rambo, Fall Jeniting, Baldwin, Keswick Codlin, Early Harvest, Red Romanite, Talman Sweet, Summer Rose, Vandevere, Pommegrise, Bell Mont, Yellow Bellflower.

The Rhode Island Greening is tender, root grafted, but top worked it does better. My orchard is one mile from the lake. I prefer planting the rows a greater distance apart east and west, and plow that way altogether.

REPORT OF W. A. SPRINGER, FREMONT, WAUPACA COUNTY.

My orchard is composed of Fameuse, Haas, Sweet Pear, Fall Stripe, Golden Russet, Perry Russet, White Gillflower and Colvert. I did not lose a tree last winter of any of the above kinds. I lost only two trees, one a seedling and the other a Hislop, both badly injured by blight the summer before.

I also had of smaller trees just coming into bearing in same orchard Walbridge, Alexander, Ben Davis, Dutchess, Tetofski, Transcendent, Soulard and Sweet Crab; did not lose but one and

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that was girdled by the mice. There are some 350 in all. The soil is a loam, with slight descent to the north—in clover.

I also had some thousands of nursery trees, now two years old. Haas, Walbridge, Sweet Pear, Ben Davis, Dutchess, Tetofski, Hislop, Transcendent, Montreal Beauty Crab, King of Tompkins county and Wolf River, all come out right. Northern Spy, Seek-no-Further and Bellflower, were badly damaged. Another orchard, 1 1-2 miles from me, of about the same size, same soil, same aspect, in clover, did not lose a tree that was not badly injured by blight the year before. The orchards most injured in this vicinity were those under cultivation, and very dry soil.

REPORT OF D. HUNTLEY, APPLETON.

We think the dry summer had as much to do in killing and injuring trees as the winter. Much discouragement prevails. All of the hardy kinds of apples, cherries, pears and plums have been more or less killed, though not as much as the more tender varieties. Trees standing in grass or those mulched, suffered not nearly as much as those that were cultivated.

Among the apples, the Duchess of Oldenburg, Red Astrachan, Fameuse, Tetofski, Golden Russet, Bailey Sweet and Ben Davis, were not killed as badly as the more tender varieties. The Talman Sweet was killed all over the county.

Messrs. Phillips, Lake Mills, Jefferson county, have an apple orchard from which they have had an average crop of 2,000 bushels per year for the last ten years; 2,500 bushels for the last three years; 4,000 bushels in one year. They report Northern Spy, Westfield Seek-no-Further, Dominie, Fameuse, Dumelow Seedling, as the best five varieties in this orchard. Sweet Wine is also profitable with them. [It is probable this is not the Sweet Wine of Downing.]

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COUNTY AND OTHER HORTICULTURAL SOCIETIES.

WINNEBAGO COUNTY HORTICULTURAL SOCIETY.

We have nothing of special interest to report relative to progress for the past year, but have moved steadily forward. Have an efficient organization, and in good working order.

The following are the officers for the present year:

President—I. J. Hoile, Oshkosh.
Vice Presidents—Hon. R. McCurdy, J. O'Brien.
Corresponding Secretary—E. S. Hayden, Oshkosh.
Recording Secretary—R. J. Harney, Oshkosh.
Treasurer—R. D. Torrey, Oshkosh.
Executive Committee—E. Chase, Isaac Miles, T. Payne, R. C. Campbell, J. R. Paddleford and President and Corresponding Secretary *ex officio*.

RICHLAND COUNTY HORTICULTURAL SOCIETY.

President—Alonzo G. James, Richland Center.
Vice President—G. W. Putnam, Ash Ridge.
Secretary—A. L. Hatch, Ithaca.

Membership, 30.

TRANSACTIONS, 1873.—Officers were elected at a meeting of the society on the second evening of the fair of the agricultural society, at Richland Center, October 1. The annual membership fee was reduced from 50 cents to 25 cents. Questions on fruit culture discussed. $10.00 were donated to the agricultural society to defray expenses of the horticultural department of the fair. Balance in treasury, $1.50. This society is intended to be auxilliary to the county agricultural society, and to encourage horticulture.

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ST. CROIX VALLEY HORTICULTURAL SOCIETY.

The third annual meeting of the St. Croix Valley Horticultural Society, for the election of officers and the transaction of other business, was held at the Brackett House, in River Falls, January 6, 1874.

The retiring President, Osborn Strahl, delivered his annual address, in which, though deploring the damaging effects of last winter, a more lively effort was urged, setting forth the absolute necessity for a more profuse cultivation and use of fruit, in order to attain to a higher degree of civilization and refinement, and as the surest method of obtaining varieties adapted to our rigid climate, the planting of seeds from such apples that have stood the winters without injury, and continue to select and plant until in time we obtain hardiness and quality.

Dr. S. M. Davis, the Corresponding Secretary, reported much active duty in his line, resulting in the procuring of cions of several new varieties of apples, mostly seedlings, to be tested and disseminated, if found worthy.

The officers for the ensuing year are:

President—S. Hunt.
Vice President—O. C. Hicks.
Recording Secretary—Osborn Strahl.
Corresponding Secretary—S. M. Davis, River Falls.
Treasurer—M. D. Proctor.
Executive Committee—O. C. Hicks, John Green and Mrs. Barker.

The number of members is 54. The society held a fair last summer, in conjunction with the Driving Park Association, paid over $60 in premiums, and is clear of debt with a small amount in the treasury.

LEMONWIER VALLEY HORTICULTURAL SOCIETY.

Organized in Fountain, Juneau county, February 3, 1874.

President—M. L. Curtis, New Lisbon.
Vice President—C. S. Whitter, Oakdale.
Treasurer—C. E. Lake, Oakdale.
Secretary and Librarian—M. L. Clark, New Lisbon.
Judge—Hon. J. T. Kingston, Necedah.
Directors—C. H. Grote, Mauston, L. G. Kniffen, Tomah.

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JANESVILLE HORTICULTURAL SOCIETY.

The officers for 1874 are :

President—Alexander Graham.
Vice President—George J. Kellogg.
Secretary—F. S. Lawrence, Janesville.
Treasurer—David E. Fifield.
Executive Committee—E. L. Dimock, S. G. Williams, C. H. Vorhes, R. J. Richardson, George H. Willeston, S. M. Rockwood.

KENOSHA HORTICULTURAL SOCIETY.

At the Annual Meeting of the Society, held at the office of the Secretary in Kenosha city, the following officers were elected for the ensuing year :

President—Stephen Galt.
Vice President—Frederick Robinson.
Treasurer—F. H. Lyman.
Secretary—J. B. Jilsum, Kenosha.

GRAND CHUTE HORTICULTURAL SOCIETY.

President—W. H. P. Bogan, Appleton.
Treasurer—P. S. Bennett, Appleton.
Secretary—D. Huntley, Appleton.

MADISON HORTICULTURAL SOCIETY.

President—Dr. Joseph Hobbins, Madison.
Vice Presidents—W. T. Leitch, J. Gripper, Madison.
Secretary—G. E. Morrow, Madison.
Treasurer—G. A. Mason, Madison.

TRANSACTIONS FOR 1873.—Several meetings for discussion. An exhibition of flowers, plants and berries in June. Active encouragement of street tree planting, resulting in the planting of some thousands of maples, elms and ash, on principal streets.

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APPENDIX.

ORCHARDS IN GRASS OR CULTIVATED LANDS.

[The frequent reference in the papers and discussions published in this volume to comparative effects of cultivated ground or ground in grass for fruit trees, makes it proper to give the following statements. Thomas Meehan, Germantown, Philadelphia, editor of Gardener's Monthly is probably the best known advocate of "Orchards in Grass." He gives his views in the article below. John J. Thomas, Union Springs, N. Y., is one of the best known and most honored of American pomologists. His view are given in detail. It should be borne in mind that neither of these gentlemen live where the effect on the ability of trees to withstand cold, is an important practical question. —*Secretary.*]

THOMAS MEEHAN, IN FORNEY'S WEEKLY PRESS.

To plant an orchard, we should take an ordinary good piece of ground, that would grow well any of the cereal crops, and after manuring it very well all over the ground, take off a crop of potatoes. After the potatoes are out put in with either rye or wheat, sowing grass seed with the grain. After the grain is cut the following fall, plant the trees at whatever distance may be agreed upon, in the rye stubble. No large holes or deep holes are needed —just large enough to get the roots in without cramping will do. ow clover in March or April of the following spring, and roll. The whole expense of planting an orchard in this way, need not not be more than five dollars per acre. So far there surely has been no great expense. At hay time cut and cure the grass, as we would any other hay field.

Now comes the time to care a little for the trees. After hay harvest, bring anything for a change, in the shape of material to top dress about the trees, *only so far as the roots extend*, not the whole surface of the orchard. This need not be a "rich compost"—ditch scrapings, kitchen waste, ashes—no matter what, and spread for a half inch deep "or so," according to richness under the tree. Mere sand will very much benefit a pear tree, if it be growing on clay soil. This do every year, widening the space top dressed as the roots extend with the age of the tree.

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If one desires to get a crop of good grass from the ground, as for a few years at least, until the trees grow large enough to cover the whole ground, it may be profitable to do, the grass also must be top dressed. No one under the sun would expect to get a crop of grass year after year from the same piece of ground without manure of some kind. But this need not be put on "two or three inches deep." It is absurd to suppose that any one would recommend such a thing. A very light dressing is sufficient. We should ask no more for the grass than any other grass field without an orchard would require. In the editor's own practice he puts on every year about six to ten dollars' worth of Baugh's superphosphate per acre, and in this way gets from two to three tons of hay to the acre from among his orchard trees.

The man who would see his grass yearly growing less and less, and forget that manure would give him a heavier crop, would as soon "forget" that his cows must be fed in order to give milk. Farming can readily do without such people. We do not write for them. As to the expense, any reader can see for himself that there is less expense in starting and managing an orchard in this way than any other; while there is infinitely more returns for the same expense, than any other plan ever recommended, except, as we have said, in special cases.

J. J. THOMAS, IN COUNTRY GENTLEMAN.

Every cultivator of the soil knows that a plant will grow with more strength and vigor when allowed plenty of room than when encroached upon and crowded by other plants. Indian corn, for example, will be stouter and larger when but two or three plants, instead of ten or twenty, occupy a single hill. Garden crops of every kind, if not properly thinned, will present a small and badly developed growth. Crowded by grass and weeds, young trees never succeed so well as when standing in a clean, mellow soil. For a similar reason, no one attempts to raise a crop of potatoes or cabbages in an unplowed meadow. In every instance, other things being equal, the young trees are found to grow several times faster when well cultivated than when standing in a hard and weedy soil or grass sod. In the thousands of experiments which we have witnessed, not a single exception has occurred to

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this rule. The disparity in the results of the two modes of treatment is often greater than ten fold. Neglected young peach trees, for example, will rarely make annual shoots more three or four inches; while under proper culture, the growth will be frequently three or four feet. Young apple, pear and cherry trees offer a less striking contrast, but a decided superiority is always seen where the soil is well cultivated. The result cannot be otherwise from the nature of things, for neither trees nor crops can succeed so well when these, with weeds and grass superadded, are all striving to feed, like a hungry herd of animals, from the same piece of ground, as when each has its separate soil for sustenance.

But as the trees grow older, and the roots extend farther and strike deeper, and consequently have a wider field and more copious source from which to draw nourishment, it is less vitally important to exclude grass. Much, however, depends on circumstances, and especially on the natural fertility of the ground. When it possesses the highest degree of richness, and the summers are long and hot, as in the western and more southern portions of the Union, cultivation may cause even too rapid and succulent a growth, and be detrimental to the ripening of the wood. In such localities orchards are much improved by seeding them down. This treatment, however, very rarely applies to any part of the more northern and eastern states, unless the retarding influence of the grass is counteracted by copious top-dressing with manure. One of the greatest drawbacks to successful fruit growing here is neglected instead of excessive cultivation.

It may therefore be laid down as a general rule, that all young orchards are to be kept constantly cultivated for at least several years; and the treatment should be continued ever afterwards, unless a top-dressing of manure can be annually or frequently given, sufficient to produce a free and healthy growth. If large bearing orchards do not send out shoots at least a foot long, the fruit which they bear will be of second size, and will not bring the best prices in market. A sufficient degree of vigor must therefore be imparted, either by cultivating the surface or by top-dressing.

The important question now occurs, which of these modes is best? The answer is, the one which can be adopted with least

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inconvenience and expense, to produce equal results. Many will at once decide that seeding to grass and top-dressing will be easier than the troublesome process of cultivating to maintain a mellow surface. But before adopting this decision, they should make a careful estimate by figures. One shallow plowing in spring and three or four harrowings may be enough to keep the surface clean and mellow, if done at the right time. The plowing will cost, say three dollars per acre, the four harrowings about two dollars more, or five dollars in all. Manuring, sufficient to produce an equal growth on most soils, according to our observations, would require from ten to twenty two-horse loads of good manure, or fifteen as an average. At only one dollar per load, the manure would cost fifteen dollars, and the drawing and spreading would be at least five dollars more, or twenty dollars in all; four times as much as to keep the surface mellow with plow and harrow. In many places the manure would cost two or three dollars per load, making the expense thirty to fifty dollars per acre. It must be borne in mind that these estimates apply to most soils at the north and east, and that in western and more southern localities less manure or less cultivation would answer, and in some places they might both be omitted altogether. But where any top-dressing is necessary to counteract the exhausting effect of a top of grass, if the owner will go into a careful estimate or record of the real expense, he will find the top dressing usually a comparatively costly operation.

One of the finest examples of the success of top-dressing bearing orchards in grass which we ever met with, was on a well managed farm in the western part of Chester county, Pennsylvania. The top-dressed trees grew better and bore better than the trees of the adjoining portion, which was kept cultivated without manure. But the comparative expense of the two modes may be inferrred from the fact that the top-dressing year after year was so copious and the manure so thickly laid on the soil, that the black mass might be everywhere seen among the blades of grass, and the loose surface easily kicked up with the boot into heaps; and for the purpose of showing the amount of attention given to this part, the owner remarked that "whenever we have any manure of whatever kind to spare, it goes to the orchard." We have no

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doubt that one-fourth part of this amount of manure, applied to the cultivated portion, would have produced an equal effect at a much less expense.

Some of the finest old bearing apple trees which we have seen, grew in deeply cultivated gardens, as well as in grass. The former were subjected to the influence of a richly manured soil, worked seven or eight inches deep; the latter threw out their long roots (as far at least as the height of the tree), and took copious supplies of food from adjacent sources near dwellings.

Much stress has been laid by some cultivators on the importance of keeping the roots near or at the warm surface of the ground. This is doubtless of importance in extreme cases, where the soil is hard and poor or water-soaked a few inches below. When it is well drained, and is deep and porous, the claimed advantage of a warmer temperature can be but slight, as it varies only a few degrees between two inches or six inches, the latter being as great in depth as ordinary cultivation extends. We have no accurate and recorded experiments, extensive enough or sufficiently long continued, to show the difference, if any, between the two modes of treatment. So far it is guess work, or a mere matter of opinion, often of the most vague nature, an example of which lately came under our notice, when a successful orchardist, who urged the importance of never disturbing the surface, had covered the whole space between his trees with ten inches of packed litter or old straw, which certainly furnished a cooler surface where the roots were, than half that depth of mellow soil. It will hardly do to cite a single example of success in any case as a conclusive proof the superior excellence of a certain point of treatment, when that success may depend entirely on something else. Questions of this kind can be determined satisfactorily only by a series of experiments, side by side, under the many variations of which they are capable, in different places, and continued for a series of years. Ten thousand and more of experiments have been tried for the past quarter century, which show the great superiority of clear and mellow cultivation for orchards, young or old, unless a sufficient substitute has been employed by a costly top-dressing, or by a naturally fertile soil.

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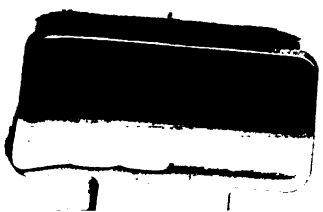

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